

MONTHLY WEATHER REVIEW.

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No. 2.

INTRODUCTION.

The REVIEW for February, 1894, is based on reports from 3,139 stations occupied by regular and voluntary observers. These reports are classified as follows: 153 reports from Weather Bureau stations; 41 reports from U. S. Army post surgeons; 2,191 monthly reports from state weather service and voluntary observers; 30 reports from Canadian stations; 221 reports through the Southern Pacific Railway Company; 475 marine reports through the co-operation of the Hydrographic Office, Navy Department, and "New York Herald Weather Service;" 28 weekly reports from 10 U. S.

Life-Saving stations; no reports from navigators on the Great Lakes; monthly reports from local services established in all States and Territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

The WEATHER REVIEW for this month has been prepared under the general editorial supervision of Prof. Cleveland Abbe. The statistical data is furnished by the Records Division, in charge of Mr. A. J. Henry, acting chief of that division.

CHARACTERISTICS OF THE WEATHER FOR FEBRUARY, 1894.

HIGH AREAS.

The most important area of high pressure was No. VII, which passed from Assiniboia and Alberta on the 19th to Wyoming on the 23d and prevailed over the central Rocky Mountain plateau until the 28th. Maximum pressures of 31.04 occurred at Calgary, Alberta, on the 19th, and 31.00 at Cheyenne, Wyo., on the 23d. The lowest temperatures recorded in this connection were, on the 19th, -38, and on the 20th and 21st, -44, at White River, Ont; on the 23d, -20, at Williston, N. Dak., -16, at Moorhead, Minn., -12, at Huron, S. Dak., Bismarck, N. Dak., and Cheyenne, Wyo.

LOW AREAS.

The lowest pressure recorded during the month was 28.80 at the center of low area No. VII on the 15th at Eastport, Me., attending the severest storm of the month.

TEMPERATURE.

The temperature of the month was generally below the average, and especially so on the northern, middle, and southern Rocky Mountain slopes, the southern plateau, the west Gulf States, and the Pacific coast.

PRECIPITATION.

The total precipitation (rain and melted snow) was above the average in the east Gulf, south and middle Atlantic States, and on the north Pacific coast. The snowfall was far above the average for February in the Appalachian range, the Middle and Eastern States.

AURORAS.

A remarkably extensive and interesting aurora occurred on the 22d and 23d, and reports of its visibility have been received from every State, except Alabama, Arkansas, District of Columbia, Florida, Georgia, Indian Territory, Louisiana, Mississippi, South Carolina, and Texas.

ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level for February, 1894, as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), is shown by isobars on Chart II, which also gives the so-called resultant wind direction for this month; these resultants are also given numerically in Tables VIII and IX of the present REVIEW. The pressures here charted are those shown by mercurial barometers uncorrected for the effect of the variation of gravity with latitude. This correction is shown by the numbers printed on the border of Chart II; it should be applied and new isobars drawn by those engaged in special researches.

The normal distribution of atmospheric pressure and normal resultant wind direction for the month of February were approximately shown on Chart VIII of the REVIEW for February, 1893, as computed by Prof. H. A. Hazen, and are not now reproduced. As compared with the normal for Febru-

ary, the mean pressure for the current month was deficient from Lake Superior north and west to British Columbia. The greatest deficiency in pressure at Weather Bureau stations was 0.04 at Williston, N. Dak.; pressure was 0.01 below the normal in North Carolina, central Mississippi, and Alabama, and above the normal in all other States. The maximum excesses were 0.11 at Eastport, Me.; 0.10 at Albany, N. Y.; 0.12 at Cheyenne, Wyo.; 0.11 at Salt Lake City, Utah; 0.10 at Eureka, Cal. This belt of average highest excess, therefore, stretches almost continuously from Maine westward to northern California. The principal region of small excess covers the south Atlantic and Gulf States.

As compared with the preceding month of January, 1894, the mean pressure for February fell 0.05 or less throughout the Atlantic and east Gulf States, California, Arizona, and New Mexico; also in Alberta, Saskatchewan, Assiniboia, and Manitoba. Pressure rose from 0.14 to 0.17 over a narrow

ridge extending from Idaho and Montana southeast over Wyoming and Colorado into northern Texas.

The periodic diurnal variations of pressure are shown by the hourly means given in Table VI.

PATHS OF HIGH AND LOW AREAS.

The paths pursued by centers of high and low pressure during February, 1894, are shown on Charts IV and I, respectively, and the duration and velocity of these movements are given in the table at the end of this chapter. The charts show by small circles the positions of the centers. Within the circles are given the pressures reported nearest the centers and the corresponding dates. If a decided trough of low pressure or ridge of high pressure exists at that time, its location is shown by a short wavy line through the center. Sometimes distant centers are connected by such ridges or troughs, but the middle portion of the wavy line is omitted in order to avoid confusing the map.

HIGH AREAS.

I, II, and III.—On the 1st, a. m., a ridge of high pressure extended from Washington to Missouri; this moved slowly eastward and on the 2d, a. m., the eastern extremity of the ridge was on the middle Atlantic coast as a detached area, No. II, while the western extremity continued in Washington and Oregon. The barometer continued high on the Pacific coast and Rocky Mountain plateau region until the 7th, a. m., and a detached area, No. III, of high pressure moved slowly southeastward over Utah into Texas and thence eastward to the south Atlantic coast. By the 8th, a. m., the principal region of high pressure had retreated westward over California, and the high barometer off the Pacific coast did not again advance eastward, so as to encroach upon the Rocky Mountain plateau region, until the end of the month.

In connection with this area cold-wave warnings were sent on the afternoon and night of the 3d to the Gulf States, from Texas eastward to Georgia, and also to northern New York and New England. On the 4th, a. m., warnings were sent to the middle and south Atlantic coast.

IV and V.—The map of the 7th, p. m., shows a pressure of about 30.2 off the south Atlantic and the south California coasts and a pressure of 29.7, or less, in Texas, the Lake region, Montana, and the intermediate region. This condition was followed by a general movement from the Canadian territory southward, and by the 8th, p. m., areas of high pressure had appeared moving southward in Alberta (IV) and Ontario (V). High area No. V moved eastward over Newfoundland and disappeared on the 9th. High area No. IV, whose central pressure was north of Alberta, moved slowly southward on the 9th, and apparently the pressure at its center must have risen while its temperature diminished. On the 10th, a. m., the highest isobar, 30.8, inclosed southern Alberta and western Assiniboia. The observations at hand do not suffice to decide whether we are to consider this central area as having moved southward into this position, or as having simply formed or developed in this location; probably the movement during the previous day had been slight and the phenomenon was mostly one of growth, depending upon the presence during the 9th of a region of low pressure advancing northeastward into British Columbia. From the 10th to the 14th, high area No. IV moved eastward at the northern limit of our stations, and finally disappeared over the Gulf of St. Lawrence.

In connection with these high areas cold-wave warnings were sent on the 8th to South Dakota, Minnesota, Nebraska, Kansas, Iowa, Wisconsin, and eastern Colorado. On the 9th warnings were sent to Oklahoma, Missouri, Arkansas, Illinois, Wisconsin, Michigan, Indiana, Ohio, Kentucky, Tennessee, western New York, Pennsylvania, and Virginia. On the 12th, in anticipation of the great cold wave that occurred, a special cold-wave dispatch was sent to the Weather Bureau observers

throughout the region from Kansas and Wisconsin southward to the Gulf and eastward to Florida and the middle and south Atlantic States announcing the approach of a protracted and severe cold wave. A special bulletin announcing freezing temperature in the sugar regions of Louisiana was sent to New Orleans on the 12th and 14th.

VI.—On the 13th and 14th pressure was high from Manitoba southwestward to California, and a high area remained central in Utah. This was a portion of a ridge of high pressure extending from California to Manitoba and Labrador, while areas of low pressure developed on its southern side in the Gulf States and on its northwestern side in Washington and British Columbia. By the 15th this ridge was represented by rather high pressures in Manitoba, California, and Texas, the latter area representing the center that had previously existed over Utah. On the 16th this moved eastward to the south Atlantic coast and disappeared in the rear of the low area (VII) that was then passing northeast over Nova Scotia.

VII and VIII.—During the 16th to the 18th pressure was high over California and the south Atlantic States, but was generally low in the interior of the United States; by the 17th, a. m., two areas of low pressure had moved to British Columbia and Lake Superior, respectively, and an area of high pressure had begun to appear in Alberta; the barometer rose very rapidly in this region, attaining its maximum, 30.96, at Medicine Hat, Assiniboia, and 31.04, at Calgary, Alberta, on the 19th, a. m. Up to this time the low pressure had remained on the Pacific coast, and winds had been light in Alberta, with steadily falling temperatures; it seems probable that the area of high pressure thus developed on this portion of the northeast slope of the Rocky Mountains was due to the flow of an upper current from the north. By the 19th, p. m., a ridge of high pressure extended from Alberta to North Dakota; by the 20th, a. m., the area of rising pressure had extended far to the southeast and east; the pressure had fallen in Montana and Alberta, and was still apparently highest in the latter. During the 20th, 21st, and 22d a ridge of 30.7 to 30.9 extended from Oregon to Kansas, and by the 23d, a. m., the highest pressure, 31.0, was central at Cheyenne, Wyo., but on the 23d, p. m., three minor maxima prevailed in Idaho, Minnesota, and Ontario. Pressure continued high over the central Rocky Mountain plateau during the 23d to 28th, inclusive, but slowly diminished from 30.9 to 30.3. On the 23d the eastern portion of high area No. VII passed eastward near Lake Superior, and thence southeast over Lake Ontario, and disappeared on the 25th off the coast of New England.

In connection with these areas of high pressure, but especially when cloudy areas were cleared away by colder dry air, numerous warnings were issued for minor cold waves as follows: 16th, to South Dakota, Wyoming, Nebraska, Minnesota, and eastern Colorado. 17th, to Nebraska, Kansas, Oklahoma, Texas, Arkansas, Missouri, Iowa, Illinois, and portions of Louisiana and Tennessee. 18th, to Wyoming, Colorado, Nebraska, Wisconsin, Minnesota, Michigan, western New York, and southward to Tennessee, Arkansas, and Oklahoma. 19th, warnings were sent to the regions still further south, viz, Texas, Louisiana, Tennessee, Mississippi, Alabama, Georgia, South Carolina, North Carolina, Virginia, Maryland, and Pennsylvania. 20th, to New Jersey, New York, and New England. On the 20th, also, special warning of a norther on the coast was sent to observers and railroad officials on the coast of Texas, Louisiana, Alabama, and Florida, and on the 21st warnings of an approaching cold wave to the interior of those States and also to Georgia, North and South Carolina. On the 23d warnings were issued to New York and New England, in connection with the cold wave that attended the eastern portion of high area No. VII.

IX.—On the 25th, a. m., the southeastern portion of high area No. VII was central in Texas, whence it moved east and northeast, and on the 27th disappeared on the middle Atlantic coast.

LOW AREAS.

I.—This depression appeared in Alberta on the 31st of the preceding month; it had evidently come from the Pacific coast of southern Alaska; it moved eastward along the northern border of our stations and disappeared on the 3d in Labrador.

II.—A general depression extended northeastward on the 2d over Mexico into Texas, where the pressure was low on the 2d, 8 p. m., with cyclonic winds and light rain. Out of this condition a well-marked low area developed in that State, which, on the 3d, a. m., was central on its eastern border. This depression moved east and northeast, with an increasing area of rain and snow, and after passing near Cape Hatteras, N. C., apparently developed into a still more severe storm.

In connection with this depression, warnings of high winds were sent to south Atlantic coast stations on the 3d and middle Atlantic stations on the 4th. In the rear of this storm the northwest winds on the Gulf coast were also signaled on the 4th.

III, IV, and V.—On the 5th the pressure was low in Alberta, and an extensive depression prevailed thence eastward for several days; this also extended southward until, by the 7th, p. m., three centers of low pressure, with cyclonic whirls, had developed, viz, No. III in Assiniboia; No. IV on Lake Superior; and No. V in Texas. No. IV passed rapidly eastward and disappeared on the 8th over the Gulf of St. Lawrence. No. III moved slowly eastward and disappeared on the 8th in Manitoba, while the southernmost of the three centers, viz, No. V, moved northeastward and rapidly increased in intensity; it was central in southern Illinois on the 8th, p. m., where its path turned to the northwest, after which it resumed its northeastward movement, passing over Lake Michigan and Lake Huron. This turn toward the northwest was accompanied by an extensive snowfall on the north and northwest sides of the central depression, and illustrates the general principle that the amount and distribution of latent heat evolved during a rainfall, and still more so during a snowfall, has an appreciable influence in modifying the intensity and movement of the central barometric depression and the cyclonic whirl. On the 10th, p. m., the area of snow prevailed on the west, south, and east sides of this low pressure, which was then central north of the St. Lawrence, and a new depression, with a cyclonic whirl, had begun to form off the coast of New England; by the 11th, a. m., the former disappeared and the latter was central off Nova Scotia.

On the 7th, while low area No. V was developing in Texas, signals for southeast winds were displayed along the Gulf coast; on the 8th, as the center approached the Lake region, the signals for northeast winds were displayed on Lake Michigan; on the 9th wind signals were displayed on the middle and east Atlantic coasts for easterly winds and on the 10th for westerly winds.

Severe tornadoes occurred on the southeast side of this depression on the 8th and 9th; warnings of these were sent as follows. On the 8th, at 10 a. m.:

To the observers in Tennessee, southern Illinois, Arkansas, and Missouri. Conditions are favorable for severe local storms this afternoon or evening.

And again on the 9th, at 10 a. m., as follows:

To observers in central and eastern Iowa, Missouri, Illinois, Indiana, Milwaukee, Grand Haven, Kentucky, Ohio, West Virginia, and Detroit. Conditions are favorable for the occurrence of severe local storms this afternoon or this evening in the States of the Ohio and the upper Mississippi valleys.

VI.—During the 8th an area of low pressure approached

Washington, and afterward stretched southeastward as the eastern end of a trough reaching from the Pacific Ocean to the Rocky Mountain plateau. In reference to this barometric depression and storm, Mr. B. S. Pague, Local Forecast Official at San Francisco, Cal., writes:

This storm moved as follows: February 8, 8 a. m., central over extreme northwestern Washington, with a slight secondary depression central at Keeler, Cal.; 8 p. m., both depressions increasing in energy and stationary. 9th, 8 a. m., the first moving southeastward, the secondary one nearly stationary; 8 p. m., the secondary low increased by the addition of the original low, extending over western and southern Nevada and eastern California. 10th, 8 a. m., the low central at Keeler, Cal., with an easterly extension over Arizona.

The fall in the barometer on the 8th, 9th, and 10th at Los Angeles and San Diego, Cal., was caused by the southerly movement of the low and not by any low moving in from the ocean on the west of Los Angeles, Cal. The forecasts made at this office were based on the movements of the low above, briefly outlined, and they were verified.

On the 10th, a. m., this area was central in southern Nevada; it then passed southeastward into Texas, where it was central on the 11th, a. m., after which it turned northeastward, passing over Arkansas on the 11th, p. m., Kentucky, 12th, a. m., and Ohio, 12th, p. m.; by this time the northeast wind on the Atlantic coast, pressing inland over the middle Atlantic States, had started a new cyclonic whirl in North and South Carolina, which was now apparently central over Chesapeake Bay; after this the former whirl died away while the latter apparently moved northeastward over the Atlantic. The storm of wind and rain or snow attending this depression was very severe in the Gulf States, on the Atlantic coast, and the Lake region.

On the 10th, p. m., while low area No. VI was in Texas, the approaching southeast winds were signaled on that coast and on the 11th, a. m., along the rest of the Gulf coast. During the 11th the ensuing northwest winds on the Gulf coast were signaled, and easterly winds were signaled on the Lake region, and the middle and south Atlantic coasts; on the 11th, p. m., the observer at Montgomery, Ala., was advised as follows:

Rain, probably changing to snow in northern portion; cold wave; conditions favorable for severe local storms.

On the 12th, a. m., northwest winds were signaled on Lake Michigan and northeast winds on the middle and east Atlantic coasts. At 3 p. m. the following was sent to the observer at Buffalo:

Reports received during the day show the storm to be very severe throughout Ohio, Pennsylvania, and western New York, with probabilities of heavy snow to-day and to-night, followed by a cold wave. Distribute information to railroads running out of Buffalo.

Special warnings were sent throughout the middle States and New England, as follows:

Notify press, shipping interests, and railroads that the storm of to-night and Tuesday will be unusually severe; heavy northeast gales and heavy snow.

And again:

Notify shipping of unusually severe storm, and advise vessels not to leave port.

The storm of Monday, February 12, was fully predicted and according to the report of Mr. E. B. Dunn, Local Forecast Official at New York, N. Y., 156 telegrams and at least 40 telephone messages were sent by him to various persons and places and to the local and general press associations. The newspapers gave the Weather Bureau the credit of probably saving much property and many lives and a great deal of the delay and inconvenience of traffic that usually occurs in such heavy storms. - Mr. Dunn states that this is the first instance on record where the larger transatlantic steamers remained in port, and that not a vessel of any description left after the warning was given; many railroad and steamboat companies thanked the Weather Bureau for the warnings. No wrecks were reported. Fourteen inches of snow fell within ten hours, or 20 per cent more than fell within an equal time during the great blizzard of March, 1888.

Among other items in connection with this storm we note the following:

In the easterly gale of the 12th and 13th, at Cape Cod, Mass., the three-masted schooner *E. I. Morrison* was destroyed at Peaked Hill Bar. A terrible blizzard of north wind and snow followed the east gale at Cape Cod on the 15th.

The schooner *Minnie Rowan* was wrecked at Scituate, Mass., about 11 p. m., February 12, but the crew was rescued by 10 p. m. of the 13th.

The "Boston Globe" of February 14, says:

Capt. C. F. Williams, agent for the Portland Steam Packet Company, who has perfected a system which in itself is a weather bureau, was at the Boston office of that company on February 12 advising a number of captains of vessels who were anxious to sail, although a storm was impending. After reading a number of dispatches from New York, Eastport, and intermediate places, the captains all concluded to remain in port.

During this storm captains of vessels passing Minot's Ledge Lighthouse stated that the sea was making a clean breach over the tower, spraying high in the air above. The Cunard steamer *Catalonia* sailed at high water, notwithstanding the storm.

At Portland, Me., on February 13, a very heavy vapor hung over the water in the harbor this morning, with intense cold, more so than ever known before. Men exposed to its touch for a few minutes found they were freezing. This remarkably cold vapor or fog extended as far as Seguin, Me., and greatly troubled the crew of the schooner *Lucy J. Warren*, as well as the steamers along the coast.

VII.—On the 12th, a. m., an area of low pressure was central over the Gulf of California, having apparently moved eastward from the Pacific over a route a little south of that followed by low area No. VI. This depression extended over northern Mexico, while northerly winds prevailed in Texas during the 13th. By the 14th, a. m., a well-marked depression and cyclonic whirl was evidently present in the Gulf of Mexico, south of Louisiana; this depression may properly be considered as originating in the western portion of that Gulf on the 13th in consequence of the steady northerly winds induced by the presence of the general depression over Mexico. In the absence of definite information to the contrary, this must be accepted as another illustration of a whirl and storm formed by the flow of cold northerly air from the Rocky Mountain plateau and slope southward into the warm air over the Gulf of Mexico. By the 15th, a. m., the storm center had passed from the Gulf northeastward over the south Atlantic States, and was central on the coast of New Jersey. In the course of this progress there had been a decided tendency to the formation of two whirls, central on the 14th, p. m., near Knoxville, Tenn., and Savannah, Ga., respectively, but these had now again combined in one. During the 15th the cold northerly winds, with snow over the lower Lakes and New England, extended over the Atlantic to the south of the center of low pressure, while increasing easterly winds, with snow, prevailed over Nova Scotia and New Brunswick. The central barometric depression rapidly increased, and on the 15th, p. m., was near Yarmouth, N. S. On the 16th, a. m., the center had passed beyond Cape Breton, after which it disappeared from our maps.

Before low area No. VII had developed into a storm center information signals were displayed on the 13th at the Gulf stations; on the 14th on the south Atlantic coast, and subsequently on the middle and east Atlantic coasts. On the 15th signals were displayed for northwest to northeast winds at the latter stations.

VIII, IX, and XI.—The two preceding depressions, originating on the southwestern border of the United States, were followed by a depression that first appeared on the extreme northwestern corner. Pressure began falling in British Columbia on the 12th, p. m., and by the 13th, p. m., had recov-

ered, but on the 14th again fell, while southerly winds continued to prevail from northern California to British Columbia, with frequent rain. By the 15th, a. m., the high pressure prevailing from the Mississippi Valley to the Pacific had retreated southward sufficiently to allow a trough of low pressure to penetrate eastward into Alberta; by the 15th, p. m., this trough had penetrated into Montana and Assiniboia, and by the 16th, a. m., into North Dakota. By the 17th, p. m., a depression was central on the northern shore of Lake Superior, while a trough containing several definite whirls and low centers Nos. IX and X extended thence westward through South Dakota to the coasts of Washington and Oregon. By the 18th, p. m., low area No. VIII was central in the Gulf of Saint Lawrence, and a series of troughs and centers of low pressure extended from Labrador southwest to Indian Territory and thence northwest to Washington and British Columbia. The area of highest pressure was north of this region and central in Alberta while larger areas of rather high pressure prevailed off the middle and south Atlantic and Gulf coasts and California. The general movement of this trough of low pressure was southward, and by the 19th, a. m., it had been divided by the penetration into Texas of northerly winds and high pressures, so that it was then represented by two low pressures, Nos. IX and XI, with a connecting trough from Arkansas to Labrador, and a separate low pressure, No. X, in California and Arizona. The depressions Nos. IX and XI filled up and disappeared on the 19th, but a third one, No. XII, also developed on that date at the mouth of the Saint Lawrence, and on the 20th disappeared in the Gulf of Saint Lawrence.

On the 16th, as low area No. VIII approached the upper Lake region, southeast winds were signaled on Lake Michigan; 17th, information signals were sent to the middle and east Atlantic coasts, where high southwest winds subsequently prevailed.

X.—The depression, which we have called No. X, extended on the 17th, p. m., as a trough from Washington southeastward into Idaho; it gradually moved southward, and on the 19th, a. m., extended over northern California and Nevada. By the 20th, a. m., a depression and cyclonic whirl had formed on the southeastern slope of the Rocky Mountains, central in the northwestern corner of Texas, where pressure had fallen very rapidly; this was evidently the ordinary case of the formation of a new whirl on the eastern side of the plateau and far to the southeast of the original whirl or trough on the western side of the plateau. The new center continued its rapid southeastern movement, and by the 20th, p. m., it was central in Louisiana, and the 21st, a. m., still farther south, on the coast of Louisiana, while northerly winds prevailed over the Texas coast and thence northeastward to New York. These winds represented the front of the advancing area of high pressure; rain or snow prevailed along the entire front, with indications of several regions of incipient cyclonic whirls. On the 21st, p. m., the area of lowest pressure was in North Carolina and the frontal region of northwest winds, with rain or snow, had now passed over the Appalachian range. The area of lowest pressure disappeared on the 22d, a. m., off the south Atlantic coast, but the cold northerly winds that followed it must have again developed into a storm region on the Atlantic Ocean.

In connection with low area No. X northwest winds were signaled on the Texas coast on the 20th.

XI and XII.—See No. IX.

XIII.—While the preceding area, No. X, was, on the 20th-21st, existing as a slight depression on the south and southeast sides of the high area that was moving southward over the Rocky Mountain region, a larger general depression prevailed over northern Mexico and the adjacent Pacific coast. No well-defined area of low pressure was evolved out of this

depression, but its presence undoubtedly had much to do with the existence and southward advance of the great area of high pressure that prevailed over the United States from the 20th to the end of the month. On the 28th, p. m., the low pressure of the northwestern coast of Mexico, which I have called No. XIII, had reappeared and the map had resumed an appearance very similar to that of February 21 and 22.

XIV.—On the 21st pressure fell in Saskatchewan, Manitoba, and Ontario, and an area of low pressure, No. XIV, was evidently passing southeastward at some distance to the north of our telegraphic reports. On the 23d, p. m., it was central in lower Canada, and 23d, a. m., near the mouth of the Saint Lawrence, after which it passed southeastward apparently over Newfoundland.

Cautionary storm signals for northwest winds on the New England coast were displayed on the 23d, a. m.

XV.—This storm center began on the 23d as a slight depression in the Gulf of Mexico, in the region between the cold northerly winds and rain of the Gulf States and the warm easterly winds and clear weather of the Florida Peninsula. In all this region the barometer was at this time still above the normal, but it fell during the 24th and 25th, while rain and snow were falling in the south Atlantic and Gulf States. On the 25th, a. m., the center of the cyclonic whirl was in northwestern Florida, but by the 25th, p. m., it was near Cape Hatteras, N. C.; after this the center of the whirl moved to the north-northwest, passing over Washington on the 26th, a. m., after which it turned more abruptly eastward, and at 8 p. m. was east of Nantucket, Mass.

Information signals were displayed on the 23d at all Gulf coast and south Atlantic stations; on the 24th northeast storm signals on the south Atlantic coast and information signals on the middle and east Atlantic; on the 25th, northeast storm signals on the middle and east Atlantic coasts. In connection with the development of this storm on the 25th and 26th, the following special dispatch was sent, on the 25th, 11 a. m., to stations in the middle Atlantic States:

Snow will extend over the middle Atlantic States and upper Ohio Valley by Monday morning, with indications that snowfall will be heavy and may interfere with railroad travel. Give this information to all railroad officials and report by letter the distribution made of this dispatch.

On the 25th, 10.30 p. m., the following dispatch was sent to Boston:

Notify railroads in southern New England that heavy snow Monday will probably interfere with travel.

XVI.—An area of relatively low pressure prevailed over Alberta and to the westward from the 23d to the 26th, during which period the barometer fell slowly over the Rocky Mountain plateau and northward. On the 26th pressure recovered

in British Columbia and Alberta, and the lowest pressure passed southeastward into Manitoba, where it was central the 26th, p. m. On the 27th the center passed eastward over Lake Superior, and on the 28th apparently filled up and disappeared in Ontario and Quebec.

XVII.—On the 27th, a. m., an area of low pressure appeared moving southeastward into Alberta, and on the 28th, p. m., it was apparently central in Manitoba.

MOVEMENTS OF CENTERS OF AREAS OF HIGH AND LOW PRESSURE.

The following table shows the date and location of the beginning and ending of each center of high or low pressure that has appeared on the U. S. Weather Maps during the month, together with the average daily and hourly velocities for the month. These averages will differ accordingly as we consider each path as a distinct unit, or give equal weight to each hour of observation.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	1, a. m.	46	118	7, p. m.	34	121	1,200	6.5	184	8
II.....	1, a. m.	39	98	2, a. m.	37	78	1,100	1.0	1,100	46
III.....	4, a. m.	33	101	7, a. m.	33	81	1,300	3.0	433	18
IV.....	8, p. m.	55	114	12, p. m.	50	65	2,400	4.0	600	25
V.....	8, p. m.	47	80	9, p. m.	48	65	800	1.0	800	33
VI.....	12, p. m.	41	113	17, a. m.	35	74	2,800	4.5	622	26
VII.....	17, a. m.	54	116	28, p. m.	40	110	1,300	11.5	113	5
VIII.....	23, a. m.	50	90	25, a. m.	41	73	1,200	2.0	600	25
IX.....	25, a. m.	31	99	27, p. m.	37	73	1,900	2.5	760	32
Sums.....							14,000	35.0	5,212	.....
Mean of 9 paths.....									579	25.2
Mean of 35.0 days.....									389	16.2
Low areas.										
I.....	1, a. m.	54	113	3, a. m.	50	70	2,000	2.0	1,000	42
II.....	3, a. m.	33	95	4, p. m.	39	70	1,700	1.5	1,130	48
III.....	7, p. m.	50	109	8, p. m.	52	98	500	1.0	500	21
IV.....	7, p. m.	47	86	8, p. m.	47	64	1,100	1.0	1,100	46
V.....	7, p. m.	30	99	11, a. m.	45	59	3,000	3.5	857	36
VI.....	8, a. m.	48	124	13, a. m.	41	70	3,900	5.0	780	32
VII.....	12, a. m.	31	114	16, a. m.	47	59	3,800	4.0	950	40
VIII.....	13, a. m.	49	127	18, p. m.	48	64	3,000	5.5	546	23
IX.....	17, p. m.	45	104	19, p. m.	34	86	1,300	2.0	650	27
X.....	17, p. m.	44	125	22, a. m.	33	75	3,700	4.5	822	34
XI.....	18, p. m.	46	88	19, p. m.	39	76	800	1.0	800	33
XII.....	19, p. m.	50	66	20, a. m.	47	60	.....	.....	.....	.....
XIII.....	21, a. m.	49	101	23, a. m.	50	62	1,800	1.0	1,800	75
XIV.....	23, p. m.	28	87	26, p. m.	42	68	1,800	3.0	600	25
XV.....	25, p. m.	53	115	27, p. m.	48	83	1,500	2.0	750	31
XVI.....	25, p. m.	53	115	27, p. m.	48	83	1,500	2.0	750	31
XVII.....	27, a. m.	55	115	28, p. m.	53	99	600	1.5	400	17
Sums.....							30,500	38.5	12,685	.....
Mean of 15 paths.....									846	35.3
Mean of 40.5 days.....									792	31.4

NORTH ATLANTIC METEOROLOGY.

[Pressure in inches and millimeters; wind-force by Beaufort scale.]

The normal barometric pressure for February over the North Atlantic Ocean, as deduced from the international simultaneous observations, is highest, 30.20 (767), in a small region between N. 26°, N. 31°, W. 34°, and W. 40°, but pressure is very uniform from the northern coast of Africa westward to the Mississippi Valley. The region of lowest pressure, 29.50 (749), includes Iceland, the southeastern coast of Greenland, and the islands of Spitzbergen. The isotherm of 30° F. passes from New Jersey northeastward, south of Newfoundland and Iceland, to northern Norway and thence southward between Norway and Sweden. The tracks pursued by storm centers, the frequency and velocity of storms are very nearly the same as for January; the average speed is 37 miles per hour for the United States and 23 for

the North Atlantic Ocean. The number of storm centers that have been traced entirely across this continent and the Atlantic Ocean averages scarcely two in February, but the number for the current month seems to be rather above the average.

As compared with January the normal pressure for February is about the same in the eastern portion of the Atlantic, but falls 0.05 over the United States and the western portion of the Atlantic and 0.10 in the region between N. 50°, N. 60°, W. 10°, and W. 35°. In general, all cyclonic whirls on the Atlantic during this month that develop into severe storms are formed at the southwestern end of large and shallow depressions where the colder and denser air driven southward by terrestrial gravitation and rotation combines with other

influences, such as the buoyancy of the warm southerly winds and the clouds, to form the cyclonic whirl. When several such whirls have been formed within a general depression one of them, usually the southern one, is most favorably situated for further special development.

The weather phenomena, and especially the movements of areas of high and low pressure over the United States, begin to assume the appearance of an orderly system only when we study the daily charts for the whole Northern Hemisphere. By tracing the isobars from day to day, as we are able to do roughly over the North Pacific, North America, the North Atlantic, and northern Europe, or about one-quarter of the whole Northern Hemisphere, and bearing in mind the normal distribution of pressure over the rest of the hemisphere, it becomes evident that what is called the general circulation of the atmosphere consists, not of a slow average motion of the air, but of a system of rapidly alternating areas of low and high pressure, with corresponding cyclonic ascending and anticyclonic descending winds. The colder air in the areas of high pressure descends by gravity and is pushed southward by centrifugal force over the rotating earth; the lighter air of the anticyclones ascends by its buoyancy, viz, a deficiency of gravity, and is pushed northward by reason of its deficient centrifugal force, which latter action is supplemented by the precipitation of its vapor, the evolution of latent heat, and the added heat due to the action of the sun on the clouds. The presence of the American and the Asiatic continents modifies this circulation in such a manner that high areas, and also low, when once they have accumulated over the Rocky Mountains, move southeastward for a time, but when they have reached the Atlantic Ocean they have generally acquired a movement toward the east or northeast, and the lower portion of the air in the high area finally moves gently over the Atlantic Ocean and Caribbean Sea. The monthly and annual average pressures, temperatures, and winds, on which mathematical hydrodynamic studies are often based, have very little resemblance to the actual or normal daily map. The maps of the "International Bulletin of Simultaneous Observations" still offer a field for hydrodynamic studies.

In addition to the storms of the North Atlantic, some accounts have been received of typhoons in Madagascar and the Indian Ocean February 4, and off the coast of Japan February 21-23. The importance of obtaining fuller information of atmospheric conditions over the ocean west of our Pacific coast gives value to the following letter from Mr. Curtis J. Lyons, Meteorologist to the Government Survey, Honolulu, Sandwich Islands, under date of March 2:

The month of February has been remarkable throughout the entire Hawaiian group for electric phenomena, there having been eight distinct thunderstorms during this month at Honolulu, and nearly all unusually heavy for this region.

The views which I expressed on the *modus operandi*, direction, etc., of these storms in my paper for the Chicago Congress have received strong confirmation, viz, that while one essential element is the convectional, pillar-like rising of moist warm air in calm, the other essential element is that a cold, strong upper current shall impinge upon or blanket the summits of these convectional masses. In the most violent of these late storms this upper current was from the northwest (north 50° west, true azimuth) rather than from west or west-southwest, as usual. Such wind being colder than the usual precipitation wind, the consequence was the formation of hail, which is very rare at sea level in this latitude, and more chain lightning than I have ever seen in any one Hawaiian thunderstorm.

The barometer was very high the first three or four days of February, higher than ever recorded at that date, with violent east-northeast winds, the low area succeeding coming on the 13th and 14th, corresponding to your great storms of the 12th. The anticyclone has returned with March.

NORTH ATLANTIC STORMS.

The paths of the following areas of low pressure and strong winds on the Atlantic Ocean during February, 1894, have been approximately traced on daily charts of simultaneous observations based on data received up to the 28th of March, through the co-operation of the Hydrographic Office, U. S.

Navy, and the "New York Herald Weather Service." The western portions of these paths are shown on Chart I.

A. This was a continuation of *F* from the January REVIEW, which was central near the coast of Norway February 1, and in Lapland 2d, after which it disappeared.

B. This was a continuation of *G* from January. It was central February 1, noon, N. 50°, W. 44°; 2d, noon, N. 58°, W. 23°; 3d, noon, about N. 64°, longitude 0°; 4th, noon, N. 62°, E. 28°.

C. This area formed on February 1 off the middle Atlantic coast, and at noon of the 2d was near the southern coast of Newfoundland; 3d, noon, N. 53°, W. 33°; 4th, noon, it had moved northeastward beyond our reports, and was followed by a general rise in the pressure in the North Atlantic.

D. This was a continuation of low area No. I, U. S. series, which was central in Ontario on the 3d; 4th, noon, it was central near Newfoundland; 5th, noon, at N. 50°, W. 43°; 6th, N. 53°, W. 33°, having combined with *E*; 7th, *D* and *E* were lost in the general whirl, whose center was then east of Iceland and near the coast of Norway, in about N. 67°, E. 10°; 8th, it had passed beyond North Cape, and pressure was comparatively high from Great Britain westward to Newfoundland.

E. This was a continuation of low area No. II, U. S. series, which left the coast of North Carolina on the morning of the 4th, and moved eastward until, on the 5th, noon, it was at N. 40°, W. 58°. It moved northeast as a long trough, central on the 6th at N. 50°, W. 40°, after which it joined the preceding area *D*.

F. On the 4th high area No. III, of the U. S. series, moved southeastward over the Gulf States and the Gulf of Mexico; during the 5th and 6th it had extended over the Atlantic States; on the 7th it spread over a large portion of the west Atlantic and adjoined the high area that had prevailed continuously over the east Atlantic near the 40th parallel. During this movement the area of low pressure near Iceland had apparently steadily developed, and extending southward until, on the 10th, noon, the isobar of 29.3 extended from N. 50°, W. 40°, to N. 50°, E. 40°, and the entire region north of this constituted an extensive depression in which a whirl at the western extremity developed on the 10th, and also one at the northeastern extremity, which was soon followed by an entire transformation in the distribution of pressure. The former whirl was, on the 10th, noon, at about N. 50°, W. 30°; 11th, noon, N. 54°, W. 16°; 12th, noon, N. 60°, E. 10°; 13th, noon, N. 60°, E. 30°; 14th, noon, still further eastward, and probably disappeared in the Ural Mountains. During its passage, on the 11th and 12th, north of Scotland destructive gales prevailed over Great Britain.

G. This was a continuation of low area No. V, U. S. series, which was central near Lake Huron at noon of the 10th; 11th, noon, off Cape Breton, N. 45°, W. 59°; 12th, noon, N. 46°, W. 50°; 13th, noon, N. 51°, W. 34°; 14th, ?; 15th, N. 53°, W. 23°; 16th, the center seemed to have moved rapidly northward and dissipated, while the barometer was rapidly rising over Europe and the east Atlantic.

H. This was a continuation of low area No. VII, U. S. series, which developed rapidly on the middle Atlantic coast on the 13th, 14th, and 15th; it was central on the 16th, noon, N. 47°, W. 47°; 17th, 18th, and 19th, it pursued a course north of our reports, but on the latter date it must have been central near Iceland. During these days pressure steadily increased over Europe, with northerly winds, as an area of high pressure advanced southwestward over Sweden, Norway, and Russia. An area of high pressure had prevailed over southwestern Europe throughout the preceding seventeen days of the month, and the fluctuations of this area had depended directly upon its accessions from the adjacent portion of the Atlantic Ocean, while the fluctuations in the latter region

had depended upon accessions from the atmosphere over the West Atlantic and the Western Continent, but on the 15th and 16th the northern side of this European high pressure began to receive an accession from the northward, illustrating the general principle that, although it is easier for the great area of high pressure in Asia to discharge its surplus eastward into Alaska and North America, yet occasions will arise in which a small surplus can flow from it northwestward and thence southwestward into Europe. The overflows northeastward from it into the North American continent exceed in number and intensity those westward into Europe. Simultaneously with this advance of cold northerly winds and high pressure over Norway and northern Europe, which began on the 15th, there occurred the advance eastward and northeastward over Mexico and the south Atlantic States of an area of high pressure which became central north of the Bermudas on the 18th, and on the 19th, N. 40°, W. 45°; 20th, N. 43°, W. 35°, and on the 21st and 22d as a ridge from N. 50°, W. 20°, to N. 30°, W. 60°; from the 17th to the 23d, the Atlantic and European areas of high pressure approached each other slowly and virtually formed one region while, at the same time, a third area of high pressure advanced from the northwest (see U. S. series, high area No. VII) southeastward over the United States, and by the 23d, noon, high pressure prevailed from W. 120° to E. 40°, and between N. 20° and N. 50°. But such an area of unusual high pressure bespeaks an unusual area of low pressure to the northward if not, indeed, also to the southward, and there are corresponding indications of the existence of areas of low pressure on the 19th off Sierra Leone, as also in the equatorial portion of South America.

I. This was a continuation of low area No. VIII, U. S. series, which passed eastward along the northern limit of the United States on the 17th and 18th, and must have been broken up in Baffins Bay on the 19th.

J. On the 19th a trough of low pressure extended from Arkansas to the mouth of the St. Lawrence, and later in the day a depression and cyclonic whirl developed off the middle Atlantic coast; this was central on the 20th, noon, near the Bay of Fundy; 21st, it disappeared north of Nova Scotia.

K. This appears as a well-developed storm center on the 24th, noon, N. 52°, W. 35°, and numerous reports of hurricane winds south and west of that locality are at hand; nothing suggesting the existence of such a storm center had been reported on the 22d or 23d, but low area No. XIV, U. S. series, was in a position to undergo rapid development as it passed over Newfoundland on the 23d; during the 25th this center moved northeastward over the Faroe Islands, and on the 26th, noon, was at about N. 65°, E. 5°; on the 27th, noon, near the Loffoden Islands, and during the 28th it was represented by a new storm center in Finland.

L. The depression or trough, of which K represents the eastern end, extended southwestward to N. 55°, W. 40°, on the 25th and 26th, but on the latter date a depression developed (see low area No. XV, U. S. series) on the middle Atlantic coast which moved rapidly northeastward; 27th, it was central at N. 45°, W. 50°; 28th, noon, N. 54°, W. 24°. This rapid motion brought areas K and L steadily nearer together, and at noon of the 28th the isobar of 29.3 inclosed

them both, and extended from N. 50°, W. 30°, to N. 63°, E. 30°; at this time northwestern Europe and the northeast portion of the Atlantic Ocean were included in the general Icelandic whirl and depression, while the west Atlantic and the eastern portion of the Western Continent were under the influence of an area of high pressure, thus very nearly duplicating the meteorological conditions that had existed from the 3d to the 6th, and again on the 24th and 25th.

OCEAN FOG FOR FEBRUARY, 1894.

The limits of fog belts west of the fortieth meridian, as reported by shipmasters, are shown on Chart I by dotted shading. East of the fifty-fifth meridian fog was reported on 10 dates; between the fifty-fifth and sixty-fifth meridians on 4 dates; and west of the sixty-fifth meridian on 7 dates. Compared with the corresponding month of the last six years, the dates of occurrence of fog east of the fifty-fifth meridian numbered 1 less than the average; between the fifty-fifth and sixty-fifth meridians, 1 less than the average; and west of the sixty-fifth meridian, 2 more than the average.

OCEAN ICE IN FEBRUARY, 1894.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for February during the last 12 years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
February, 1883	42 01	52 46	February, 1883	46 10	45 44
February, 1884	42 00	50 00	February, 1884	46 50	43 45
February, 1885	41 50	51 12	February, 1885	47 52	42 00
February, 1886	46 10	47 15	February, 1886	48 00	44 47
February, 1887	40 00	48 00	February, 1887	46 26	41 50
February, 1888	44 59	45 08	February, 1888	44 59	45 08
February, 1889	45 35	48 00	February, 1889	45 35	48 00
February, 1890	41 12	50 12	February, 1890	44 30	35 30
February, 1891	44 20	48 00	February, 1891	44 33	44 59
February, 1892	47 25	47 55	February, 1892	49 05	49 30
February, 1893	45 11	48 50	February, 1893	46 20	46 40
February, 1894	44 28	48 50	February, 1894	47 30	44 40
Mean	43 44	48 50	Mean	46 29	44 22

The region in which Arctic ice was reported for the current month is shown on Chart I by crosses. The southernmost ice reported, a large berg, noted on the 25th, was about three-fourths of a degree north of the average southern limit, and the easternmost ice noted, a large berg, observed on the 28th in the position given in the table, was about one-half of a degree west of the average eastern limit of ice for February.

Icebergs were reported on the 8th, 10th, 12th, 13th, 17th, 18th, 20th, 23d, 24th, 25th, and 28th. Field ice in large quantities was noted near Cape Breton Island on the 4th and 13th. Field ice was also encountered on the 7th to 10th, 12th, 17th, 18th, 24th, and 28th. A report of the British steamship *Barcelona* states: "About 300 miles off the coast of Newfoundland passed through large quantities of field ice extending to within a few miles of St. Johns." (Date unknown.)

No icebergs were reported during the month of February, 1894. On the 13th and 20th field ice was encountered off the southeast coast of Newfoundland. On the 15th, 17th to 25th, and 27th field ice was reported along the eastern edge of the Grand Banks, north of the forty-fifth parallel.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The distribution of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high

irregular surface of the Rocky Mountain plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the

country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

NORMAL TEMPERATURE.

In Table II, for voluntary observers, the mean temperature is given for each station, but in Table I, for the regular stations of the Weather Bureau, both the mean temperatures and the departures from the normal are given for the current month. In the latter table the stations are grouped by geographical districts, for each of which is given the average temperature and departure from the normal; the normal for any district or station may be found by adding the departures to the current average when the latter is below the normal and by subtracting when it is above.

MONTHLY MEAN TEMPERATURE.

For the regular stations of the Weather Bureau the monthly mean temperature is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

During February, 1894, the mean temperature was highest at Key West, Fla., 72.2, and was above 60 throughout the Peninsula of Florida. The temperature averaged 32 in a zone passing from central New Jersey westward to southern Ohio, Indiana, and Illinois, southern Missouri, northern Oklahoma and Texas, central New Mexico, northern Arizona, western Nevada, western Oregon, central Washington, and thence northward along the western slope of the Rocky Mountains. The lowest mean temperatures in the United States were between 5 and 10 in eastern Montana and the northern parts of North Dakota and Minnesota and Maine. The temperature of 39 prevailed on the immediate coast of Washington, as also in central Virginia and the southern peninsula of Maryland. The lowest mean temperature reported was -1.6 at White River, on the northern shore of Lake Superior.

DEPARTURES FROM NORMAL TEMPERATURE.

As compared with the normal for this month temperatures were in excess over Lake Huron, Lake Superior, northern Wisconsin and Minnesota, Manitoba, Assiniboia, Saskatchewan, Alberta, and northern Washington; the maximum excess was 6.6 at Winnipeg, Manitoba; temperatures were also slightly in excess at Hatteras, N. C., and in the southern portion of the Peninsula of Florida. The monthly averages were below the normal throughout the remaining portion of the United States; the maximum deficits were from 4 to 5 in Vermont, eastern New York, Illinois, Arkansas, Mississippi, and Louisiana, and from 7 to 8 in northern Texas, western Kansas, Colorado, Wyoming, Utah, and Nevada.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for February for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for February, 1894; (4) the departure of the current month from the normal; (5) the extreme monthly means for February and the years of their occurrence during the period of observation:

State and station.	(1) Normal for the month of Feb.	(2) Length of record.	(3) Mean for Feb., 1894.	(4) Departure from normal.	(5) Extreme monthly means for February.			
					Highest.	Year.	Lowest.	Year.
Arizona.	0	Years	0	0	0		0	
Fort Apache	39.8	22	35.2	-4.6	43.6	1879	32.4	1880
Fort Mohave	56.3	22	.....	.....	62.0	1879	50.2	1882
Whipple Barracks	39.1	22	28.6	-10.5	46.1	1879	28.6	1894

Departures from normal temperature—Continued.

State and station.	(1) Normal for the month of Feb.	(2) Length of record.	(3) Mean for Feb., 1894.	(4) Departure from normal.	(5) Extreme monthly means for February.			
					Highest.	Year.	Lowest.	Year.
Arkansas.	0	Years	0	0	0		0	
Keesees Ferry	40.8	12	37.0	-3.8	49.9	1882	32.2	1885
California.								
Riverside	52.1	12	48.4	-3.7	58.0	1886	48.0	1891
Colorado.								
Las Animas	31.4	12	17.8	-13.6	37.9	1888	17.8	1894
Florida.								
Merritts Island	66.2	12	65.1	-1.1	72.6	1883	58.0	1889
Georgia.								
Forsyth	52.5	20	52.3	-0.2	59.6	1890	44.5	1885
Idaho.								
Boise Barracks	33.7	20	28.9	-4.8	40.3	1888	21.3	1883
Fort Sherman	26.5	10	.....	.....	37.0	1886	17.0	1887
Indiana.								
Lafayette	29.2	14	25.4	-3.8	38.0	1882	14.7	1885
Iowa.								
Cresco	15.5	22	15.4	-0.1	31.3	1878	1.0	1875
Kansas.								
Eureka Ranch	30.2	11	20.6	-9.6	37.6	1888	20.6	1894
Independence	35.6	22	30.6	-5.0	45.7	1882	25.2	1885
Louisiana.								
Grand Coteau	59.4	11	54.2	-5.2	64.6	1887	52.4	1885
Maine.								
Orono	19.2	23	16.0	-3.2	25.0	1877	13.3	1885
Maryland.								
Cumberland	31.5	23	31.2	-0.3	40.0	1890	25.2	1875
Michigan.								
Kalamazoo	25.9	18	23.4	-2.5	35.0	1882	11.2	1885
Missouri.								
Sedalia	33.2	11	27.4	-5.8	45.9	1882	20.7	1885
Montana.								
Fort Custer	18.6	12	12.8	-5.8	30.2	1886	2.4	1887
Nebraska.								
Fort Robinson	24.5	10	20.3	-4.2	33.7	1886	15.9	1891
Genoa (near)	22.1	18	18.0	-4.1	32.8	1877	13.2	1891
Nevada.								
Brown	37.6	23	.....	.....	49.0	1872	24.8	1883
Carson City	34.0	17	29.7	-4.3	42.2	1886	23.9	1883
New Hampshire.								
Hanover	18.7	23	18.4	-0.3	25.4	1890	10.8	1885
New Mexico.								
Fort Wingate	33.5	23	28.6	-4.9	40.0	1879	26.0	1880
New York.								
Cooperstown	21.2	23	18.6	-2.6	31.6	1880	10.5	1885
Plattsburg Barracks	18.0	23	12.8	-5.2	25.7	1877	7.2	1885
North Carolina.								
Lenoir	40.7	21	40.7	0.0	49.0	1890	30.3	1875
Oklahoma.								
Fort Reno	38.5	10	.....	.....	45.2	1890	33.0	1885
Fort Sill	42.5	22	35.8	-6.7	47.8	1892	35.6	1885
Fort Supply	36.4	15	26.6	-9.8	44.1	1882	26.6	1894
Oregon.								
Bandon	44.1	10	43.2	-0.9	49.2	1889	38.8	1887
Pennsylvania.								
Dyberry	22.5	23	20.2	-2.3	30.1	1890	13.4	1875
Grampian	25.0	23	23.9	-1.1	33.8	1890	13.7	1885
Wellsboro	26.5	14	23.6	-2.9	34.0	1890	16.7	1885
South Carolina.								
Statesburg	50.3	13	49.9	-0.4	56.6	1890	41.8	1885
South Dakota.								
Fort Sully	17.0	23	19.4	+2.4	33.4	1877	2.2	1887
Texas.								
Austin	54.5	22	.....	.....	60.6	1890	48.8	1893
Silver Falls	46.1	8	36.3	-9.8	47.9	1886	36.3	1894
Utah.								
Terrace	30.3	21	28.5	-1.8	40.7	1886	16.0	1882
Vermont.								
Stratford	18.3	20	15.9	-2.4	25.7	1877	11.0	1885
Virginia.								
Dale Enterprise	36.8	14	34.1	-2.7	44.8	1890	23.9	1885
Washington.								
Fort Townsend	39.9	22	36.5	-3.4	47.0	1885	31.7	1887
West Virginia.								
Parkersburg	38.0	13	33.8	-4.2	48.0	1882	30.1	1889
Wisconsin.								
Madison	20.7	23	18.0	-2.7	33.5	1881	3.2	1875
Wyoming.								
Fort Washakie	22.2	11	15.1	-7.1	35.8	1886	-1.0	1883

YEARS OF HIGHEST MEAN TEMPERATURE FOR FEBRUARY.

The mean temperature for February, 1894, was not the highest on record at any regular Weather Bureau station during the current month, as indeed might be expected from the fact that almost the whole country experienced average temperatures below the normal.

YEARS OF LOWEST MEAN TEMPERATURE FOR FEBRUARY.

The mean temperature for February, 1894, was the lowest on record at the regular stations mentioned in the following table, which also gives the previous lowest temperatures recorded:

Lowest mean temperature for February.

Stations.	Feb., 1894.	Departure from normal.	Lowest previous.	
			Temperature.	Year.
Springfield, Mo.	32.0	-4.9	32.6	1889
Lodge City, Kans.	24.3	-8.0	25.8	1885
Abilene, Tex.	40.8	-7.3	44.4	1893
San Antonio, Tex.	51.9	-4.5	53.0	1883
Corpus Christi, Tex.	55.2	-3.7	57.0	1889
El Paso, Tex.	44.3	-5.6	46.7	1880
Carson City, Nev.	31.6	-4.0	33.0	1890
Fresno, Cal.	46.8	-2.9	47.8	1890
San Diego, Cal.	50.5	-4.5	50.8	1880

MAXIMUM TEMPERATURE.

The maximum temperatures at regular stations of the Weather Bureau are given in Table I, from which it appears that the highest maximum temperatures have been: Jupiter, Fla., 85; Titusville, Fla., 84; Corpus Christi and San Antonio, Tex., 83; Key West, Fla., and Yuma, Ariz., 82; Palestine, Tex., 81; Tampa and Jacksonville, Fla., 80. The lowest maxima have been: Idaho Falls, Idaho, 35; Baker City, Oreg., 40; Moorhead, Minn., and Sault Ste. Marie, Mich., 41; Salt Lake City, Utah, and Saint Paul, Minn., 42; Eastport, Me., and Minneapolis, Minn., 43; Northfield, Vt., Williston, N. Dak., and Huron, S. Dak., 44; Saint Vincent and Duluth, Minn., Green Bay, Wis., Grand Haven, Mich., and Oswego, N. Y., 45.

MINIMUM TEMPERATURE.

The lowest temperatures recorded at regular stations of the Weather Bureau are given in Table I, from which the following are selected. The highest minima have been: Key West, Fla., 55; Jupiter, Fla., 39; Tampa, Fla., 36; San Francisco, Cal., 38; Point Reyes Light, Cal., 36; Titusville, Fla., and Los Angeles, Cal., 35; Port Eads, La., and San Diego, Cal., 34; Jacksonville, Fla., 33; New Orleans, La., and Sacramento, Cal., 32; Hatteras, N. C., Mobile, Ala., Yuma, Ariz., Fresno and Red Bluff, Cal., 30. The lowest minima have been: Northfield, Vt., -31; Williston, N. Dak., Idaho Falls, Idaho, and Lander, Wyo., -28; Saint Vincent, Minn., and Sault Ste. Marie, Mich., -26; Miles City, Mont., -25.

ACCUMULATED TEMPERATURE.

From January 1 to the end of the current month the average temperature for each geographical district was above or below the normal by amounts that are given by adding together the departures, as given in Table I in heavy faced type for the respective months. The average departure is then found by dividing these sums by the proper number of months. If this average departure were added to the normal temperature and multiplied by the number of days, it would give the accumulated temperature, as that term is used by some phenologists. If, however, we confine our attention to the average departures from normal values, we obtain an equally plausible basis for the comparison of temperatures and crops.

In regions where the accumulated temperature has been deficient, the average deficit for the period was as follows: New England, 0.2; northern slope, 0.1; middle slope, 1.05; southern slope, 1.3; southern plateau, 3.8; middle plateau, 2.1; north Pacific coast, 0.5; middle Pacific coast, 2.55; south Pacific coast, 3.0.

In regions where the accumulated temperature was in excess, the average excess for the period was as follows: Middle Atlantic coast, 1.2; south Atlantic coast, 1.15; Key West, Fla., 0.5; east Gulf States, 0.75; west Gulf States, 0.45; Ohio Valley and Tennessee, 1.65; lower Lake region, 1.9; upper Lake region, 2.5; North Dakota, 0.9; upper Mississippi Valley, 1.25; Missouri Valley, 0.65; northern plateau, 1.4.

DIURNAL PERIODICITY.

The regular diurnal period in temperature is shown by the

hourly means given in Table V for all stations having self-registers.

DAILY AND MONTHLY RANGES OF TEMPERATURE.

The greatest daily range of temperature is given for each of the regular Weather Bureau stations in Table I, from which the following are selected:

Greatest daily ranges.—Pueblo, Colo., 53; Lander, Wyo., 50; Denver, Colo., and North Platte, Nebr., 47; Northfield, Vt., and Abilene, Tex., 46; Columbia, Mo., and Pikes Peak, Colo., 45; St. Vincent, Minn., Williston, N. Dak., Carson City, Nev., and Idaho Falls, Idaho, 43; Miles City, Mont., Pierre, S. Dak., Valentine, Nebr., and Yuma, Ariz., 42; Huron, S. Dak., 41.

Smallest daily ranges.—The maximum daily ranges were less than 20 at the following stations: Port Eads, La., 19; Galveston, Tex., 18; Key West, Fla., 17; San Francisco and Point Reyes Light, Cal., 16; Fort Canby and Tatoosh Island, Wash., 10.

Monthly ranges.—The extreme monthly ranges can be computed for each Weather Bureau station from the data given in Table I, from which it appears that monthly ranges of 60 or more occurred in New England, the upper Lake region, and the Rocky Mountain slope.

Largest monthly ranges.—Lander, Wyo., 77; Northfield, Vt., and Pueblo, Colo., 75; Pierre and Rapid City, S. Dak., 74; Miles City, Mont., 73; Williston, N. Dak., 72; St. Vincent, Minn., Bismarck, N. Dak., Valentine and North Platte Nebr., 71.

Smallest monthly ranges.—Key West, Fla., and Eureka, Cal., 27; Fort Canby and Tatoosh Island, Wash., 23; Point Reyes Light, Cal., 24.

LIMITS OF FREEZING TEMPERATURE.

The southern limit of the region within which the air has had a freezing temperature at some time during the month is approximately shown by the full and dotted lines on Chart V, joining the places at which the minimum temperatures of 32 and 40, respectively, occurred within the instrument shelters of the Weather Bureau; the latter minimum is usually accompanied by a more or less severe frost on the ground outside of the shelter. During February, 1894, the line of minimum 40 crossed the south portion of Florida, just below Titusville, Fla., and does not reappear on the Gulf or the California coasts within the limits of the United States. The line of the minimum 32 passes from just above Jacksonville southwest across the head of the Florida peninsula and reappears in the southeastern portion of Louisiana, where, also, it again disappears; it reappears at the head of the Gulf of California and disappears on the coast of northern California.

PERIODS OF HIGH TEMPERATURE.

The maximum temperatures of the month occurred as usual in connection with the eastward progress of areas of high pressure, with northerly winds, and low pressure, with southerly winds, provided the sun shines clear in the middle of the day. Thus, on the 7th, the maximum temperatures of the month occurred at Havre and Helena, Mont., and Baker City, Oreg., and also at Omaha, Nebr., Columbia, Mo., Keokuk and Dubuque, Iowa, St. Paul and Duluth, Minn., and Alpena, Mich.; these two regions of high temperature were clear spaces on the southwestern side of low areas Nos. III and IV, respectively, and so far as concerns the first area in Idaho and Montana the air in that region was undoubtedly rapidly descending in its flow toward low area No. IV. On the 9th the maximum temperatures of the month occurred over the greater part of Tennessee, Kentucky, Indiana, Ohio, Lake Erie, West Virginia, western Pennsylvania, Virginia, North Carolina, and northern Georgia and Alabama; this entire region was on the south and southeast sides of low area No. V, which was at that time central near Lake Michigan.

On the 27th the maximum temperatures of the month occurred over the greater part of Missouri, Illinois, Wisconsin, and adjoining States, which area was at that time to the south of low area No. XVI.

On the 18th the maximum temperatures of the month occurred over the greater part of New England and the middle Atlantic States, which were at that time to the south and southeast of low area No. VIII.

PERIODS OF LOW TEMPERATURE.

The lowest temperatures of the month occurred on the 11th at many stations in California and Idaho, over which region the cold air was then descending from the high area, No. IV, central in Manitoba. On the same date, and in connection with the same area, the lowest temperatures occurred at Tucson, Ariz., Denver, Colo., Miles City, Mont., and Williston and Bismarck, N. Dak. On the 12th the cold air from this high area descended into Texas and brought the lowest temperatures of the month to many stations in that State.

On the 17th an area of high pressure (No. VII) and low temperatures advanced from Alberta southeastward, and in connection with this came the lowest temperatures of the month, beginning on the 17th at Keeler, Cal., and extending, on the 19th, to Nebraska and Manitoba, and by the 21st to Illinois, Iowa, and Wisconsin, and by the 24th to Ohio and Michigan, and by the 25th to New York, New England, and the middle and south Atlantic States. The slow progress and extensive influence of this area of high pressure, with its clear, dry weather and intense radiation, and the strong winds that marked its advancing front, were the most notable features of the meteorology of the month.

AREAS OF 20° FALL IN TWENTY-FOUR HOURS.

A fall of 20, or more, in temperature in twenty-four hours is not called a cold wave by the Weather Bureau unless the temperature falls below 40, and is, therefore, likely to cause a frost injurious to vegetation, but all falls of 40 are indicated on the Daily Weather Map by inclosing the areas within which they occur by heavy dotted lines, and the following list enumerates these regions for the month of February. An approximate idea of the size of the area covered is given by stating in miles the lengths of the two principal dimensions when these can be given; one of these is necessarily omitted when the area extends beyond the region covered by the Weather Map. The falls of 20 in twenty-four hours may be divided into two classes: (1) those due to the local radiation consequent upon the clearing away of cloudy skies; (2) those due to the advent of cold winds attending the progress of an area of high pressure; such winds are more severe on the south and east sides of areas of high pressure, but the temperatures are often a little lower in other portions of the area; the injuries to delicate plants and the unpleasant harshness to human beings are often due to the dryness as much as to the coldness, in which respect the effects of the dry, cold winds that penetrate the mild climate of California and the Gulf States resemble the dry, hot winds of the summer season in Kansas.

(A) This was a continuation of area S of January. 1st, p. m., an area of 300 by 200 miles in eastern Texas; also 400 by 200 miles in Tennessee and the Ohio Valley. 2d, a. m., 400 by 200 miles in West Virginia and North Carolina.

(B) 2d, p. m., 200 by 200 miles in Manitoba. 3d, a. m., 300 by 500 miles, Wyoming and Montana; 800 by — miles, Manitoba and Ontario. 3d, p. m., 500 by 300, miles New Mexico and Kansas, and 500 by 200 miles, lakes Superior and Ontario. 4th, a. m., 800 by 400 miles, Texas, Arkansas, and Missouri; 600 by 400 miles, Ontario and the lower Lake region; p. m., 800 by 200 miles, Louisiana to North Carolina; 500 by 400 miles, Lake Huron to Vermont. 5th, a. m., 800 by 400 miles, northern Florida, Mississippi, and North Carolina; 700

by 200 miles, eastern New York, Pennsylvania, New Jersey, New England, and Nova Scotia.

(C) 8th, p. m., 300 by 200 miles, Wyoming; 500 by 200 miles, Alberta and Montana. 9th, a. m., 700 by 400 miles, Assiniboia, Montana, Wyoming; p. m., 600 by 500 miles, Idaho, Montana, North and South Dakota, Manitoba, and Nebraska. 10th, a. m., 400 by 600 miles, South Dakota, Minnesota, Nebraska. Iowa, Missouri; p. m., 100 by 300 miles, Wyoming; 300 by 100 miles, Colorado and Kansas; 400 by 200 miles, Minnesota and Wisconsin; 200 by 100 miles, Ohio. 11th, a. m., 300 by 200 miles, northern Texas and western Kansas; 400 by 300 miles, Ontario; p. m., 700 by 500 miles, Indian Territory, Oklahoma, and Texas; 800 by — miles, Ontario and Vermont. 12th, a. m., 600 by 500 miles, Texas, Arkansas, Louisiana; 900 by 300 miles, Ontario, Quebec, Vermont, and New Hampshire; p. m., 200 by 100 miles, Arkansas; 500 by — miles, New Brunswick and Cape Breton. 13th, a. m., 400 by 300 miles, Tennessee, Alabama, and Georgia; p. m., 200 by — miles, eastern North Carolina. This closes the long path followed by the area of falling temperature which first appeared on the 8th in Alberta and Wyoming, moved slowly south to Texas, and thence east over North Carolina. In the first portion of its path it may be considered as a mass of descending cold, dry air on the front of an area of high pressure, but in the latter portion of its path the fall of temperature was due largely to the radiation consequent on the clearing off of the skies in the rear of low area No. VI.

(D) 9th, p. m., temperatures in New Brunswick and Nova Scotia had fallen 20 in twenty-four hours in connection with an area of high pressure moving southward, but this area of falling temperature then disappeared.

(E) 15th, p. m., temperatures had fallen 20, or more, in southern Georgia and central Florida over an area 200 by 300 miles, consequent on the clearing away of rain clouds in the rear of low area No. VII, and in front of the eastward moving high area No. VI. 16th, a. m., 400 by 200 miles, Florida Peninsula.

(F) 15th, p. m., pressure was falling rapidly throughout the Rocky Mountain plateau region, while low area No. VII was near the Bay of Fundy; an area of clearing cold weather moved southward over Ontario and, by the 16th, a. m., a fall of 20, or more, prevailed on the northern shores of lakes Superior, Huron, and Ontario, covering an area of at least 600 by 300 miles. 16th, p. m., 700 by 300 miles, Ontario, northern New York, and New England. 17th, a. m., 700 by 200 miles, Vermont, New Hampshire, Maine, New Brunswick, and Nova Scotia.

(G) 16th, a. m., temperature had fallen 20, or more, in northern Alberta; p. m., 400 by 200 miles, Saskatchewan, Assiniboia, and Montana. 17th, a. m., 300 by 100 miles, Saskatchewan and Assiniboia; p. m., 500 by 200 miles, Manitoba, North and South Dakota, and Minnesota. 18th, a. m., 900 by 400 miles, Manitoba, Ontario, Minnesota, Wisconsin, Iowa, and northern Illinois; p. m., 300 by 300 miles, Lake Superior.

(H) 17th, a. m., an area of 20 fall, 500 by 300 miles, covered portions of Utah, Colorado, and Wyoming; this could not have resulted from the southward movement of cold air from the region (G) which was some distance to the northward, but separated by a trough of low pressure; on the contrary the falling temperature of area H must have been due principally to local radiation at plateau stations, which were then coming under the influence of an area of high pressure pushing from the southwest over California and the central plateau region; this area of falling temperature disappeared the next day, inasmuch as its cold air flowing eastward over Colorado became rapidly warmed up.

(I) 18th, a. m., 100 by 200 miles, western Arkansas; this small region of 20 fall was evidently due to local radiation.

(J) 17th, p. m., 400 by 150 miles, western Montana and southern Alberta. 18th, a. m., 200 by 100 miles, western half of South Dakota; p. m., 600 by 200 miles, eastern Montana, western South Dakota, and eastern Nebraska. 19th, a. m., 400 by 400 miles, South Dakota, Nebraska, Kansas, and western Iowa; p. m., 1,200 by 300 miles, Wisconsin, Iowa, Illinois, Missouri, Kansas, Oklahoma, and Texas. 20th, a. m., 200 by 200 miles, Lake Huron; 200 by 100 miles, Arkansas; 200 by 200 miles, Texas; 400 by 200 miles, Wyoming and Colorado; these four smaller areas represent the gradual expansion of the front of high area No. VII, as it spread from Alberta east and south; p. m., 200 by 200 miles, northern New Hampshire, Vermont, and New York; 500 by 150 miles, Wyoming, Colorado, and northern Texas; these two widely-separated areas represent, respectively, the eastern extremity of high area No. VII pushing into New England and its southwestern edge pushing southward up the slope of the Rocky Mountains. 21st, a. m., 100 by 400 miles, southern Colorado to central Texas; p. m., 800 by 200 miles, southern Texas, Louisiana, and central Mississippi. 22d, a. m., 300 by 200 miles, southern Texas; p. m., 500 by 400 miles, New Mexico and Arizona; the fall of temperature in this region showed that the great area of high pressure, No. VII, with its cold air, had surmounted the Rocky Mountain plateau and was sending an overflow southwestward over New Mexico and Arizona into the Gulf of California; the pressure, which had been low at Yuma and Tucson, Ariz., with warm southerly winds, now suddenly rose, with cold northerly winds; the southward flow of cold air from Kansas to the coast of Texas still continued. 23d, a. m., 100 by — miles, Arizona and southward; the temperature continued falling at Tucson during the night, 22-23d, and, in fact, throughout Nevada and California, but the area of 20 fall included the former station only; this ended the advance of sudden falls of temperature in connection with high area No. VII; the central region of this area remained during the rest of the month moving very slowly south and west over the Rocky Mountain plateau; its central highest pressure slowly diminished from 30.9 to 30.3, and the central temperatures slowly rose from -10, on the morning of the 22d, to 34, on the morning of the 28th, at which time the greater portion of the United States lay under the influence of high pressures and rising temperatures.

(K) 22d, p. m., 300 by 200 miles, Manitoba; this fall of temperature was accompanied by a corresponding rise in the barometer and northerly winds, belonging to high area No. VIII, which approached from Saskatchewan, notwithstanding the presence of high area No. VII. 23d, a. m., 1,000 by 400 miles, Manitoba, Minnesota, and Ontario; p. m., 700 by 400 miles, Ontario, northern New York, Vermont, New Hampshire, and Maine. 24th, a. m., 1,100 by 400 miles, New Jersey, New York, Ontario, New England, Nova Scotia, and New Brunswick; p. m., 400 by 200 miles, New Brunswick, Nova Scotia, and Cape Breton.

FROSTS.

The frosts that occurred in February, within the limits of the United States, partook rather of the nature of cold waves and freezing weather, and can hardly be presented in a table of first or last frosts; they will, therefore, be mentioned under "Temperature as affecting agriculture."

COLD WAVES.

In addition to the general account of areas of 20° fall of

temperature, some notes relative to the special severe cold wave that prevailed from the 24th to the 26th are given under "Temperature as affecting agriculture," and again under "Local storms" for those dates.

TEMPERATURE AS AFFECTING AGRICULTURE.

The following records of cold and warm periods are taken from the reports of the State Weather Services:

Arizona.—A range of temperature of 71° was recorded at Whipple, Baracks.

Florida.—Frost occurred as far south as Titusville on the east coast, and Tarpon Springs on the Gulf coast, and Lee County in the interior; the frost of the 18th was the most extensive.

Kansas.—This has been one of the coldest Februaries on record, having been exceeded but six times within the past 37 years.

Louisiana.—Despite the fact that the precipitation was not excessive yet the cold, damp, and disagreeable weather prohibited much farm work, even in the northern parishes, and the general statement is that farmers are considerably behind in their work. Abbeville: taken as a whole the month was very unfavorable for farm work; considerable plant cane, in open mats, has been frozen; cattle are dying from exposure and cold. Clinton: this has been the severest and worst February for years; no planting has been done; the fruit crop is doubtless injured as many of the trees had bloomed. Coushatta: farming is backward; some spring-sown oats are reported killed; country roads almost impassible. New Orleans: during the entire week, from the 18th to 24th, not a ray of sunlight was observed. Plain Dealing: farmers are behind with work; a few peach blooms observed.

Mississippi.—On the 24th and 25th there was a general storm of snow and sleet, and in the northern and central districts trees were covered with ice for two or three days.

Missouri.—Akron: wheat looks well; stock all healthy and in fine condition; feed plentiful. Gallatin: fine weather up to the 10th, and again after the 12th, but during the 11th and 12th 19 inches of snow fell; with the exception of a few days, when the snow was too deep, the entire month was favorable for out-door work. Oregon: during the month the ground was frozen to the depth of two feet; portions of the snowdrifts remained on the ground from the 11th to the close of the month. Marceline: the blizzard of the 12th was the severest storm in years and stock was necessarily driven to shelter. Eldon: stock is wintering fine and in good condition. Houston: fruit buds appear to have been greatly damaged by the cold spell in January. Ironton: peaches are killed and possibly plums and raspberries; some oats have been sown; ground in good condition to work. Oak Ridge: peaches are all killed; wheat not looking so well; oats not yet sown. Olden: wheat is looking well; stock in good condition. Poplar Bluff: farmers sowing oats and ploughing for corn. Arthur: wheat has stood the winter well; stock is doing well. Half Way: wheat on lowlands somewhat injured. Panacea: the variable temperature has been very hard on stock. Virgil City: farmers have commenced sowing oats.

Nevada.—Notwithstanding the heavy snowfall, stock has been doing fairly well, except in the eastern portion of the State.

New Jersey.—Friesburg: the amount of snow remaining on the ground has been of too short duration to afford much protection to the crops. Millville: no ice has been gathered in this vicinity, owing to the mild winter; considerable plowing and early spring work has been done; rye and wheat are looking well; fruit trees have not yet started enough to be injured.

South Carolina.—The warmest days occurred on the 3d at 6 stations, on the 9th, 10th, and 11th at 20 stations, on the 19th and 20th at 12 stations; the coldest days occurred on the 5th and 6th at 7 stations, on the 16th at 6 stations, and on the 24th and 25th at 24 stations. Long Shore: plum trees in bloom on the 5th. Columbia: peach trees in bloom on the 12th.

Utah.—Storms of the 9th, 10th, and the 20th-21st reached almost the severity of blizzards.

Wisconsin.—The month was in general cold; on the last day of the month in the southern half of the State, containing nearly all the winter grain, the ground was entirely bare and the frost rapidly coming up; conditions very unfavorable for crops, as considerable freezing weather must ensue. Cadiz: clover, wheat, and rye have wintered in good condition. City Point: cranberry vines have been well covered during the whole month; logging camps will break up by March 1. Harvey: from the 9th to 26th snow was probably sufficient to fairly protect the crops; since then the ground has been bare and freezing nights.

Wyoming.—The mean temperature for the month was decidedly below the normal. La Barge: snow in the mountains west of this station is from 6 to 10 feet deep; stock on the range is wintering badly.

PRECIPITATION.

[In inches and hundredths.]

The distribution of precipitation over the United States and Canada for February, 1894, as determined by reports from about 2,000 stations, is exhibited on Chart III. In Tables I, II, and III, the total precipitation is given for each station; the departures from the normal are given for regular stations of the Weather Bureau in Table I. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above. The average departure for each State is given in the chapter of reports from the State Weather Services.

NORMAL PRECIPITATION.

The normal precipitation for the month of February is usually greatest on the coasts of Washington and Oregon, where it exceeds 8.00. The average for all the Atlantic States is about 4.00; for the Ohio Valley about 3.00; for the Lake region, 2.00; and for the rest of the interior about 1.00 or 2.00.

PRECIPITATION FOR FEBRUARY, 1894.

The total precipitation for February, 1894, exceeded 10.00 at most of the stations on the immediate coast of Washington and northern Oregon; it was from 6.00 to 8.00 on the coast of southern Oregon and northern California; from 12.00 to 16.00 in a small portion of southeastern Alabama and northwestern Florida; from 8.00 to 12.00 in a belt from central Arkansas to central Tennessee. No rain fell in the neighborhood of Yuma, Ariz., and it averaged less than one-half an inch over the region between Texas, Montana, and Lake Superior.

DEPARTURES FROM NORMAL PRECIPITATION.

The precipitation for February was in excess of the normal in the middle and south Atlantic States and Ohio Valley and north Pacific coast region. It was generally deficient in other portions of the United States. The principal deficits were: Eastport, Me., 2.8; Jupiter, Fla., 2.8; Titusville, Fla., 3.4; Los Angeles, Cal., 2.9. The principal excesses were: Tatoosh Island, Wash., 3.1; Neah Bay, Wash., 4.4; New Orleans, La., 6.8; Mobile, Ala., 4.8; Pensacola, Fla., 5.3

Considered by districts the precipitation for February, 1894, when compared with the normal for the month, furnishes the following percentages (precipitation is in excess when the percentage of the normal exceeds 100): East Gulf States, 168; middle slope, 169; north Pacific coast, 124; middle Atlantic States, 126; south Atlantic States, 122; Ohio Valley and Tennessee, 121; lower Lake region, 107; middle plateau, 100; Missouri Valley, 93; northern plateau, 90; New England, 90; west Gulf States, 89; upper Mississippi Valley, 86; middle Pacific coast, 86; southern plateau, 85; southern slope (Abilene, Tex.), 81; upper Lake region, 70; northern slope, 61; North Dakota, 50; south Pacific coast, 45; Key West, Fla., 1.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for February for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for February, 1894; (4) the departure of the current month from the average; (5) the extremes for February and the years of occurrence during the period of observation:

Departures from average precipitation.

State and station.	(1) Average for the month of Feb.	(2) Length of record.	(3) Total for Feb., 1894.	(4) Departure from average.	(5) Extremes for February.			
					Greatest.		Least.	
					Am't.	Year.	Am't.	Year.
<i>Arizona.</i>	<i>Inches.</i>	<i>Years.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>		<i>Inches.</i>	
Fort Apache	1.89	18	0.96	- 0.93	4.10	1891	0.89	1889
Fort Mohave	0.91	22	.....	.....	5.00	1874	0.00	.....
Whipple Barracks	1.84	22	0.30	- 1.54	6.55	1884	0.01	1876
<i>Arkansas.</i>								
Keesee Ferry	4.45	12	5.40	+ 0.95	10.93	1884	1.24	1892
<i>California.</i>								
Riverside	2.56	13	0.35	- 2.21	7.94	1884	0.00	1885
<i>Colorado.</i>								
Las Animas	0.26	12	1.10	+ 0.84	0.59	1888	0.00	1891
<i>Florida.</i>								
Merritts Island	2.80	16	0.21	- 2.59	6.01	1888	0.15	1882
<i>Georgia.</i>								
Forsyth	4.74	20	9.69	+ 4.95	9.69	1894	1.19	1879
<i>Idaho.</i>								
Boise Barracks	1.69	20	0.82	- 0.87	6.49	1872	T.	1889
Fort Sherman	2.30	11	4.00	+ 1.70	5.81	1890	0.42	1889
<i>Indiana.</i>								
Lafayette	3.30	14	2.61	- 0.69	7.43	1883	1.20	1889
<i>Iowa.</i>								
Cresco	1.02	22	0.47	- 0.55	1.88	1887	0.07	1877
<i>Kansas.</i>								
Independence	2.15	22	2.12	- 0.03	7.04	1881	0.25	1872
<i>Louisiana.</i>								
Grand Coteau	3.27	11	6.05	+ 2.78	8.42	1891	1.37	1886
<i>Maine.</i>								
Orono	4.01	23	1.73	- 2.28	8.39	1876	1.20	1877
<i>Maryland.</i>								
Cumberland	2.64	21	3.76	+ 1.12	4.92	1882	0.60	1877
<i>Michigan.</i>								
Kalamazoo	2.64	18	0.98	- 1.66	5.44	1881	0.12	1877
<i>Missouri.</i>								
Sedalia	2.64	15	2.31	- 0.33	6.42	1892	0.65	1879
<i>Montana.</i>								
Fort Custer	0.48	14	0.28	- 0.20	1.29	1885	0.02	1882
<i>Nebraska.</i>								
Fort Robinson	0.58	10	0.43	- 0.15	1.12	1885	0.19	1892
Genoa (near)	0.82	18	0.54	- 0.28	2.55	1891	0.10	1889
<i>Nevada.</i>								
Brown	0.57	23	.....	.....	2.05	1872	0.00	1882, '89
Carson City	1.41	17	2.83	+ 1.42	4.18	1891	0.08	1877
<i>New Hampshire.</i>								
Hanover	2.52	22	2.02	- 0.50	7.67	1887	1.20	1875
<i>New Mexico.</i>								
Deming	0.47	11	0.66	+ 0.19	1.78	1888	0.00	1883, '90
Fort Wingate	1.65	23	1.85	+ 0.20	11.20	1873	0.05	1881
<i>New York.</i>								
Cooperstown	2.35	23	2.00	- 0.35	5.21	1887	0.63	1877
Plattsburg Barracks	1.40	23	1.37	- 0.03	2.69	1880	0.20	1888
<i>North Carolina.</i>								
Lenoir	4.32	22	5.66	+ 1.34	9.00	1873	0.60	1877
<i>Oklahoma.</i>								
Fort Reno	1.09	9	0.50	- 0.59	2.84	1889	0.13	1891
Fort Sill	1.24	22	0.72	- 0.52	3.45	1881	T.	1876
Fort Supply	0.83	15	1.04	+ 0.21	3.06	1874	0.00	1887
<i>Oregon.</i>								
Bandon	9.02	16	10.87	+ 1.85	17.82	1881	2.11	1892
<i>Pennsylvania.</i>								
Dyberry	2.90	23	2.73	- 0.17	6.58	1893	0.60	1877
Grampian	3.75	22	2.14	- 1.61	7.62	1887	1.56	1872
Wellsboro	5.48	14	2.25	- 3.23	10.93	1884	0.95	1887
<i>South Carolina.</i>								
Statesburg	3.07	12	5.86	+ 2.79	5.86	1894	1.18	1883
<i>South Dakota.</i>								
Fort Sully	0.43	23	T.	- 0.43	1.50	1871	T.	1894
<i>Texas.</i>								
Austin	2.50	22	.....	.....	7.22	1888	T.	1885, '93
Silver Falls	0.79	7	0.12	- 0.67	2.07	1887	T.	1891
<i>Utah.</i>								
Terrace	0.39	19	0.50	+ 0.11	1.30	1881	0.00	*
<i>Vermont.</i>								
Stratford	2.94	20	3.80	+ 0.86	5.90	1887	0.30	1877
<i>Virginia.</i>								
Dale Enterprise	3.36	14	3.57	+ 0.21	9.00	1884	0.83	1882
<i>Washington.</i>								
Fort Townsend	1.93	19	1.76	- 0.17	3.94	1879	0.37	1886
<i>West Virginia.</i>								
Parkeburg	3.75	9	3.60	- 0.15	7.42	1887	1.40	1886
<i>Wisconsin.</i>								
Madison	1.70	23	0.46	- 1.24	5.42	1881	0.30	1877
<i>Wyoming.</i>								
Fort Washakie	0.33	11	0.45	+ 0.12	1.04	1881	0.04	1882

*Frequently.

ACCUMULATED PRECIPITATION.

From the beginning of the year to the end of February, 1894, the total precipitation was in excess of the normal, decidedly, in the north and middle Pacific and northern plateau regions and the east Gulf States. It was especially

deficient in the south Pacific and southern plateau regions and Key West, Fla. In detail the accumulated precipitation, as compared with the normal value, furnishes the following percentages: Northern plateau, 145; north Pacific coast, 122; east Gulf States, 116; middle Pacific coast, 106; Missouri Valley, 104; middle plateau, 103; middle slope, 100; middle Atlantic States, 96; lower Lake region, 95; southern slope (Abilene, Tex.), 95; Ohio Valley and Tennessee, 94; south Atlantic States, 93; upper Mississippi Valley, 86; New England, 85; northern slope, 84; upper Lake region, 80; west Gulf States, 77; North Dakota, 67; southern plateau, 58; south Pacific coast, 50; Key West, Fla., 32.

YEARS OF GREATEST PRECIPITATION FOR FEBRUARY.

The precipitation was the greatest on record for the month of February at Astoria, Oreg., being 11.87, or 4.7 above the normal; the largest previous record was 11.48, in 1890; at Pensacola, Fla., being 9.22, or 5.3 above the normal; the largest previous record was 8.98, in 1881.

YEARS OF LEAST PRECIPITATION FOR FEBRUARY.

The precipitation was the least on record for the month of February at Bismarck, N. Dak., being 0.04, or 0.6 below the normal; the lowest previous record was 0.16, in 1880; Eastport, Me., being 1.28, or 2.8 below the normal; the lowest previous record was 1.34, in 1877.

EXCESSIVE PRECIPITATION.

The following tables for February, 1894, show, by states, the number of stations reporting total precipitation to equal or exceed 10.00 inches during this month; 2.50 in 24 hours, and 1.00 in 1 hour:

Monthly precipitation to equal or exceed 10.00.

State.	Number of stations.	State.	Number of stations.
California	18	Arkansas	3
Louisiana	11	Georgia	2
Alabama	8	Tennessee	2
Oregon	6	Florida	1
Washington	6		

Daily precipitation to equal or exceed 2.50 in 24 hours.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
California	32	8, 8-9, 9, 15, 17-19, 18-19, 19, 19-20, 20.	Florida	3	11, 21, 24-25.
Arkansas	25	2-3, 3, 3-4, 7, 7-8, 8.	Indiana	3	12, 12-13.
Tennessee	25	2-3, 3, 3-4, 7-8, 8.	North Carolina	2	11-12, 14-15.
Louisiana	20	11, 20, 20-21, 21, 22-23, 23, 23-24.	Washington	2	4-5, 6-7.
Alabama	15	2-3, 9, 10-11, 11, 11-12, 19, 23.	Indian Territory	1	8.
Mississippi	6	2-3, 3, 11, 19-20.	Michigan	1	9.
Georgia	5	11, 11-12, 21-22.	New Jersey	1	2-3.
			Oregon	1	25-26.
			Texas	1	7-8.

Hourly precipitation to equal or exceed 1.00.

Alabama	1	17.			
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Excessive precipitation, February, 1894.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.	Rainfall 1 inch, or more, in one hour.
		Amt. Day.	Amt. Time. Day.
Alabama.	Inches.	Inches.	Inches h. m.
Auburn	3.80	11-12	
Brewton	16.54	9-00	11
Citronelle	10.08		
Eufaula	10.20	5-30	11-12
Florence	3-30	2-3	

Excessive precipitation—Continued.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.	Rainfall 1 inch, or more, in one hour.
		Amt. Day.	Amt. Time. Day.
Alabama—Continued.	Inches.	Inches.	Inches h. m.
Florence	3.57	2-3	
Fort Deposit	10.44	11-12	
Geneva	5.66		
Highland Home	2.94	11-12	
Mobile	2.93	11-12	
Newton	4.10	11	
Do	3-03	23	
Rock Mills	3-02	11	
Selma	13.94	10-11	2 15 2 00 17
Do	3-26	19	
Starlington	11.51	2-80	11
Tallassee Falls	3-02	11-12	
Union Springs	3-45	11-12	
Arkansas.			
Bee Branch	2-80	3	
Do	6-00	7	
Brinkley	2-80	2-3	
Cassville	3-73	7-8	
Conway	3-40	2-3	
Do	3-00	7-8	
Corning	2-62	8	
Dardanelle	10.33	4-40	7-8
Forrest	2-60	2-3	
Fort Smith	3-00	7-8	
Helena	2-92	3-4	
Hot Springs	3-10	3	
Do	2-77	7-8	
Hot Springs (near)	3-38	3	
Kirby	3-00	2-3	
Do	3-60	7-8	
Lonoke	3-00	2-3	
Mount Ida	10.38	3-04	3
Do	4-54	7-8	
Mount Nebo	4-90	7-8	
New Gascony	2-64	3-4	
Newport	3-15	2-3	
Do	3-16	7-8	
Newport	3-01	2-3	
Do	3-01	7-8	
Osceola	2-55	7-8	
Ozark	4-50	7-8	
Russellville	3-85	7-8	
Searcy	11.46	3-40	2-3
Do	4-94	7-8	
Stuttgart	2-75	2-3	
Warm Springs	4-00	7-8	
Wiggs	2-55	8	
California.			
Boulder Creek	13.87		
Cloverdale	2-73	19	
Covelo	3-35	19	
Edmanton	2-71	8	
Do	7-26	17-19	
Eldorado	11.90		
Emigrant Gap	15.50		
Felton	12.78		
Folsom City	2.91	19-20	
French Corral	2.80	19	
Georgetown	16.25	7-36	19-20
Grass Valley	11.72	4-65	19
Iowa Hill	12.25	2-99	19-20
Jackson	10.84	3-89	19
Kelseyville	2-72	19	
Kennedy Gold Mine	11.86	2-58	8-9
Do	4-75	19-20	
Lagrange	2-95	19-20	
Laurel	11.33		
Lick Observatory	10.52	3-46	19-20
Lodi	2-77	19	
Mariposa	2-58	9	
Do	2-98	19	
Middletown	6.11	17-19	
Milton (near)	4-37	19-20	
Mokelumne Hill	3-56	19	
Nevada City	10.85	3-70	19
Newcastle	3-38	19	
Oleta	2-50	18-19	
Orangevale	2-59	19	
Placerville	14.40		
Placerville	13.02	4-53	18-19
Pleasanton	2-53	19	
Represa	3-05	19-20	
Santa Cruz	3-50	20	
Shasta Springs	3-25	15	
Stockton	2-63	20	
Sutter Creek	2-50	20	
Towles	10.10		
Truckee	10.95		
Ukiah	3-75	19	
Upper Mattole	11.97	3-09	18-19
Wire Bridge	3-33	20	
Florida.			
Moseley Hall	2.90	24-25	
Pensacola	4.18	11	
Tallahassee	11.19	3-90	21
Georgia.			
Lagrange	2-55	11	
Lumpkin	4-45	11-12	
Marshallville	10.41	2-70	11
Morgan	10.06		

Excessive precipitation—Continued.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Georgia—Continued.		Inches.	Inches.	Inches	h. m.	
Piscola			2.60	21-22		
Talbotton			2.52	11-12		
Indiana.						
Huntingburg			2.75	12		
Indianapolis			2.69	12-13		
Marengo			2.50	12		
Indian Territory.						
Kemp			2.56	8		
Louisiana.						
Abbeville			5.24	20-21		
Alexandria			2.51	11		
Baton Rouge			3.00	20-21		
Cameron			3.16	21		
Covington		12.48				
Donaldsonville		10.15	3.41	21		
Emilie		12.93	3.67	20-21		
Do			5.30	22-23		
Franklin			2.80	21		
Hammond			2.60	22-23		
Houma		10.36	4.50	23		
Jeannette		10.23	3.10	20		
Lafayette			2.65	20-21		
Lake Charles			2.70	20-21		
New Orleans		11.06	3.59	20-21		
Opelousas			3.08	23		
Paincourtville		10.28	3.75	20-21		
Do			3.44	22-23		
Shell Beach			3.00	20		
Sugar Experimental Station		13.43	3.25	20		
Do			2.50	23		
Thibodeaux		11.58	2.66	22		
Wallace		11.25	3.08	20-21		
Do			2.50	22-23		
West End		13.23	3.88	20-21		
Do			3.03	23-24		
Michigan.						
Brown City			3.35	9		
Mississippi.						
Batesville			2.58	3		
Biloxi			3.04	19-20		
Clarksdale			2.22	2-3		
Kosciusko			2.80	11		
University			2.50	3		
Vicksburg				1.62	1 00	11
Waynesboro.			3.30	11		
Missouri.						
Gayoso			2.60	2-3		
New Jersey.						
Newton			2.92	25-26		
North Carolina.						
Falkland			2.62	14-15		
Highlands			2.74	11-12		
Oregon.						
Astoria		11.87				
Bandon		10.87				
Cascade Locks		10.71				
Glenora		18.44	3.10	7		
Langlois		11.92				
Toledo		13.05				
Tennessee.						
Ashwood			3.70	3		
Bolivar			3.75	3		
Columbia			3.50	2-3		
Covington		12.07	5.99	7-8		
Florence Station			3.14	2-3		
Franklin			2.77	2-3		
Greenville			3.33	3		
Hohenwald		10.10	3.75	2-3		
Jacksboro			2.65	3		
Jackson			2.70	7-8		
Johnson City			2.50	3-4		
Knoxville			3.25	2-3		
Loudon			2.90	3-4		
Lynnville			3.40	3-4		
Memphis			3.07	2-3		
Nashville			2.92	2-3		
Do			2.85	7-8		
Newport			3.60	2-3		
Nunnelly			2.66	3		
Palmetto			3.33	3		
Riddleton			2.67	3		
Rockwood			4.30	2-4		
Savannah			4.13	3		
Trenton			2.85	3		
Do			3.00	3		
Waynesboro			3.00	3		
Wier			2.97	2-3		
Texas.						
Weatherford			2.60	7-8		
Washington.						
Aberdeen		12.28				
East Clallam		13.14				
Ferry			2.52	6-7		
Lapush			2.51	4-5		
Neah Bay			15.52			
Tatoosh Island			11.65			
Union City			10.66			

Excessive precipitation received too late for publication in January, 1894.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
California.		Inches.	Inches.		Inches	h. m.
Covelo	15.53	4.86	14	.....	.....	.....
Do		3.54	20	.....	.....	.....
Oklahoma Territory.						
Stillwater		3.51	19	.....	.....	.....
Oregon.						
Aurora (near)	14.90	2.61	13	.....	.....	.....
Forest Grove.	11.63			.....	.....	.....
Vernonia	13.98	2.67	13	.....	.....	.....

MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during February, 1894, for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering rain gauges. This record refers strictly to rainfall. About 37 stations are furnished with the self-registering float rain gauge and 6 with the self-registering, weighing, rain and snow gauge. The float gauge does not record snowfall, and the frequent interruptions of both the self-registers, due to snow and ice, explain the numerous cases of incomplete record.

Maximum rainfall in one hour or less.

Station.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		Inch.		Inch.	
Atlanta, Ga.	0.25	8	0.35	8	0.51	8
Boston, Mass.	0.02	15	0.04	15	0.16	15
Buffalo, N. Y.	0.02	9	0.04	9	0.14	9
Cincinnati, Ohio *	0.05	17	0.07	17	0.24	17
Detroit, Mich. *	0.02	17	0.03	17	0.12	9, 17
Galveston, Tex.	0.25	21	0.32	21	0.70	22
Indianapolis, Ind. *	0.12	8	0.18	8	0.30	8
Jacksonville, Fla.	0.15	19	0.25	19	0.40	19
Jupiter, Fla.	0.02	15	0.03	15	0.10	15
Kansas City, Mo. *	0.05	9	0.10	9	0.15	9
Key West, Fla. †						
Memphis, Tenn.	0.17	8	0.23	3	0.70	3
Nantucket, Mass.	0.07	18	0.11	15	0.18	18
Nashville, Tenn.	0.08	8, 19	0.15	19	0.35	19
New Orleans, La.	0.14	22	0.25	22	0.70	19, 21
Norfolk, Va. *	0.06	15	0.10	15	0.27	15
Philadelphia, Pa. *	0.04	19	0.07	19	0.16	9
Portland, Oreg. *	0.03	17	0.05	17	0.15	17
St. Louis, Mo. *	0.05	8	0.08	8	0.30	8
San Diego, Cal.	0.03	16	0.05	16	0.12	16
San Francisco, Cal.	0.06	15	0.08	15	0.20	19
Savannah, Ga. *	0.05	25	0.09	25	0.23	21
Vicksburg, Miss.	0.26	11	0.44	11	1.62	11
Wilmington, N. C.	0.05	4, 14	0.08	14	0.28	14

* Record incomplete.

† Less than 0.05 in 1 hour.

FREQUENCY OF HEAVY PRECIPITATION SINCE 1870.

The following tables show the number of years for which monthly precipitation to equal or exceed 10.00 inches, daily precipitation to equal or exceed 2.50 inches, and hourly precipitation to equal or exceed 1.00 inch has been reported at regular stations of the Weather Bureau in the several States and Territories for February during the last 24 years:

Frequency of excessive monthly precipitation.

State.	No. years noted.	State.	No. years noted.
California	16	Arkansas	4
Oregon	13	Connecticut	3
Washington	12	Kentucky	3
Tennessee	11	Pennsylvania	3
North Carolina	9	Illinois	3
Alabama	9	Massachusetts	3
Texas	8	Ohio	3
Indiana	6	Rhode Island	3
Mississippi	6	South Carolina	3
Georgia	6	Kansas	1
New York	5	Michigan	1
Florida	5	New Hampshire	1
Louisiana	5	New Mexico	1

Frequency of excessive monthly precipitation—Continued.

State.	No. years noted.	State.	No. years noted.
Virginia.....	1	Maryland.....	0
Arizona.....	1	Minnesota.....	0
Utah.....	1	Missouri.....	0
Colorado.....	0	Montana.....	0
The Dakotas.....	0	Nebraska.....	0
Delaware.....	0	Nevada.....	0
District of Columbia.....	0	New Jersey.....	0
Idaho.....	0	Vermont.....	0
Indian Territory.....	0	West Virginia.....	0
Iowa.....	0	Wisconsin.....	0
Maine.....	0	Wyoming.....	0

Frequency of excessive daily precipitation.

Texas.....	15	Massachusetts.....	3
Alabama.....	14	Arizona.....	2
Georgia.....	14	Iowa.....	2
Tennessee.....	14	New Jersey.....	2
New York.....	11	Washington.....	2
Arkansas.....	11	The Dakotas.....	1
Louisiana.....	11	Delaware.....	1
North Carolina.....	11	Rhode Island.....	1
Florida.....	10	South Carolina.....	1
Illinois.....	9	Indian Territory.....	1
Mississippi.....	9	Colorado.....	0
Oregon.....	8	District of Columbia.....	0
California.....	7	Idaho.....	0
Kentucky.....	6	Minnesota.....	0
Connecticut.....	5	Montana.....	0
Ohio.....	5	Nebraska.....	0
Indiana.....	5	Nevada.....	0
Michigan.....	5	New Hampshire.....	0
Pennsylvania.....	4	New Mexico.....	0
Missouri.....	4	Utah.....	0
Kansas.....	3	Vermont.....	0
Maryland.....	3	West Virginia.....	0
Virginia.....	3	Wisconsin.....	0
Maine.....	3	Wyoming.....	0

Frequency of excessive hourly precipitation.

Tennessee.....	8	Kentucky.....	0
Mississippi.....	5	Maine.....	0
Texas.....	4	Maryland.....	0
North Carolina.....	4	Massachusetts.....	0
California.....	3	Minnesota.....	0
Alabama.....	2	Missouri.....	0
Arkansas.....	2	Montana.....	0
Florida.....	2	Nebraska.....	0
Georgia.....	1	Nevada.....	0
Louisiana.....	1	New Hampshire.....	0
Michigan.....	1	New Jersey.....	0
Pennsylvania.....	1	New Mexico.....	0
Arizona.....	0	Ohio.....	0
Colorado.....	0	Oregon.....	0
Connecticut.....	0	Rhode Island.....	0
The Dakotas.....	0	South Carolina.....	0
Delaware.....	0	Utah.....	0
District of Columbia.....	0	Vermont.....	0
Idaho.....	0	Virginia.....	0
Illinois.....	0	Washington.....	0
Indiana.....	0	West Virginia.....	0
Indian Territory.....	0	Wisconsin.....	0
Iowa.....	0	Wyoming.....	0
Kansas.....	0		

EXCEPTIONAL PRECIPITATION.

The following tables give exceptionally heavy monthly, daily, and hourly precipitation reported for February by any station, regular or voluntary, and in any year:

Exceptional monthly precipitation.

Station and state.	Am't.	Year.	Station and state.	Am't.	Year.
	Inches.			Inches.	
Boulder Creek, Cal.....	34.03	1891	Felton, Cal.....	21.69	1891
Cuyamaca, Cal.....	32.20	1891	Summit, Cal.....	20.70	1887
Laurel, Cal.....	28.95	1891	Crescent City, Cal.....	20.55	1891
Cisco, Cal.....	22.85	1887	Highlands, N. C.....	20.20	1891

Exceptional daily precipitation.

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
	Inches.			Inches.	
Stonewall Mine, Cal.....	23.90	21-24, 1891	Maurepas, La.....	7.55	15, 1891
Cuyamaca, Cal.....	22.40	22-23, 1891	Julian, Cal.....	7.48	23-24, 1891
Santa Rosa Ranch, Cal.....	15.33	21-23, 1891	Georgetown, Cal.....	7.36	19-20, 1894
Oneida, N. Y.....	10.10	13, 1874	Edmonton, Cal.....	7.26	17-19, 1894
Brewton, Ala.....	9.00	11, 1894	Oakland, Cal. a.....	6.65	15, 1891
Emile, La.....	8.42	12-14, 1891	Farleys Camp, Ariz.....	6.45	17-18, 1891

Exceptional daily precipitation—Continued.

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
	Inches.			Inches.	
Campo, Cal.....	6.40	21-22, 1891	Monroe, La.....	5.73	12-13, 1891
Luling, La.....	6.24	13-14, 1891	Geneva, Ala.....	5.60	9, 1894
Palermo, Cal.....	6.12	14-15, 1891	Eufaula, Ala. a.....	5.30	11-12, 1894
Middletown, Cal.....	6.11	17-19, 1894	Emile, La.....	5.30	22-23, 1894
Vacaville, Cal. a.....	6.10	14-15, 1891	Athens, Ga.....	5.26	7, 1891
Highlands, N. C.....	6.01	8-9, 1891	Abbeville, La.....	5.24	20-21, 1894
Bee Branch, Ark.....	6.00	7, 1894	Lynnville, Tenn.....	5.15	16-17, 1893
Covington, Tenn. a.....	5.99	7-8, 1894	Los Gatos, Cal.....	5.12	14-15, 1891
Mt. Vernon B'ks, Ala.....	5.82	13, 1891	Kosciusko, Miss.....	5.00	12-13, 1891
Corpus Christi, Tex.....	5.80	3, 1891			

Exceptional precipitation for one hour or less.

Station and state.	Amount.	Time.	Date.
	Inches.	h. m.	
Jupiter, Fla.....	0.45	0 05	25, 1893
Memphis, Tenn.....	0.30	0 05	6, 1892
Vicksburg, Miss.....	0.26	0 05	11, 1894
Atlanta, Ga.....	0.25	0 05	8, 1894
Galveston, Tex.....	0.25	0 05	21, 1894
Memphis, Tenn.....	0.25	0 05	8, 1891
Do.....	0.55	0 10	6, 1892
Little Rock, Ark.....	0.70	0 12	6, 1892
Louisville, Miss.....	1.93	0 30	26, 1890
Galveston, Tex.....	3.31	1 00	22, 1888

MONTHLY SNOWFALL.

The depth of snow that fell during the month of February, 1894, as reported by both regular and voluntary observers, is shown by the lines and figures on Chart V, which also gives, by the full line, the limit at which minimum temperatures of 32° F. were at any time reported at the regular Weather Bureau stations; by the dotted line is given a similar limit for 40°. These air temperatures within Weather Bureau shelters are, of course, higher than would be given by thermometers exposed in the open air. The line of 40° within a shelter approximates to the limit of frosts on the open surface of the ground. The actual depths of snowfall when above 10 inches and the depth of snow at the end of the month are given together in a following section. As compared with the normal it will be seen that snowfall has been remarkably heavy throughout the Appalachian range and nearly the whole area of the Middle and Eastern States. In New York and Pennsylvania it was from two to three times its normal value. It was also above the normal in the mountains of Colorado.

SPECIAL SNOWFALL, FEBRUARY 24-26, 1894.

The following table shows the time of beginning and ending and the total depth of snowfall reported during the storm of February 24-26, 1894, at stations in the Southern States:

Stations.	Beginning and ending.	Depth.
		Inches.
Alabama.		
Florence.....	24-25th.....	8.0
Lynn.....	24-25th.....	5.0
Maple Grove.....	10 a. m., 24th, to 6 p. m., 25th.....	4.0
Newburg.....	8 a. m., 24th, to 6 p. m., 25th.....	9.0
Oxanna.....	24-25th.....	5.0
Rock Mills.....	24-25th.....	4.5
Scottsboro.....	24-25th.....	6.0
Talladega.....	7 a. m. to 4:35 p. m., 25th.....	1.0
Arkansas.		
Arkansas City.....	8 a. m., 24th, to 10 a. m., 25th.....	4.0
Ashdown.....	8 a. m., 24th, to p. m., 25th.....	3.0
Blanchard Springs.....	8 a. m., 24th, to 10 a. m., 25th.....	4.0
Brinkley.....	11 a. m. to 5 p. m., 24th.....	5.0
Cassville.....	7 p. m., 24th, to 4 a. m., 25th.....	4.0
Conway.....	2 p. m., to 11 p. m., 24th.....	1.5
Forrest City.....	11 a. m., 24th, to 1 p. m., 25th.....	4.0
Fort Smith.....	4 p. m., 24th, to 7:15 a. m., 25th.....	4.2
Gaines Landing.....	25th.....	4.0
Helena.....	10:30 a. m., 24th, to p. m., 25th.....	6.0
Little Rock.....	12:25 p. m., 24th, to 12:18 p. m., 25th.....	3.0
Newport.....	5 p. m., 24th, to 11 a. m., 25th.....	1.5
Osceola.....	25th.....	7.0
Ozark.....	25th.....	2.8

Special snowfall—Continued.

Stations.	Beginning and ending.	Depth.
Arkansas—Continued.		
Bison	24-25th	8.0
Searcy	2 p. m., 24th, to 11 a. m., 25th	2.8
Stuttgart	25th	3.0
Washington	24th	4.0
Winslow	6 p. m., 24th, to 6 a. m., 25th	5.0
Georgia		
Atlanta	At intervals, 24-25th	6.0
Clayton	25th	6.0
Diamond	25-26th	4.0
Elberton	24-25th	5.0
Hephzibah	25th	4.0
Lafayette	24-25th	9.0
Lagrange	24-25th	5.8
Lawrenceville	25th	4.0
Leverette	24-25th	3.2
Louisville	25th	3.0
Marietta	25th	4.0
Monticello	25th	2.0
Point Peter	24-25th	3.0
Rome	25-26th	2.5
Louisiana		
Bastrop	24-25th	3.0
Coushatta	24th	1.5
Delhi	25th	1.0
Farmerville	24th	2.0
Girard	25th	1.0
Lake Providence	24-25th	2.0
Liberty Hill	24th	3.0
Monroe	25th	1.0
Natchitoches	25th	1.0
Oxford	24-25th	1.2
Plain Dealing	24th	3.2
Shreveport	At intervals, 24-25th	2.7
Mississippi		
Aberdeen	7 p. m., 24th, to 4.20 p. m., 26th	7.0
Agricultural College	24th	1.0
Batesville	24th	5.0
French Camps	24-25th	2.0
Greenville	24th	3.0
Ita Bena	24-25th	3.0
Okolona	25th	2.0
Palo Alto	3 a. m., 24th, to 4 p. m., 25th	3.0
Pontotoc	Noon, 24th, to 6 p. m., 25th	6.0
Yazoo City	25th	1.0
North Carolina		
Asheville	25-26th	6.5
Bailey	25th	10.0
Bakersville	10 p. m., 24th, to 2 a. m., 26th	14.0
Blowing Rock	25th	12.0
Bryson City	7 p. m., 24th, to 7 p. m., 25th	5.0
Columbus	8 p. m., 24th, to 10 p. m., 25th	6.0
Flat Rock	25-26th	9.0
Henderson	3.30 a. m., 25th, to 7 a. m., 26th	7.5
Highlands	5 p. m., 24th, to p. m., 25th	8.0
Horse Cove	6 p. m., 24th, to 10 p. m., 25th	9.0
Lenoir	11 p. m., 24th, to night, 25th	8.0
Littleton	25th	6.0
Lynn	24-25th	7.2
Marion	25th	14.0
May	24-25th	5.0
Mocksville	Night, 25th, to night, 26th	10.0
Mount Airy	24-25th	6.0
Mount Pleasant	9 p. m., 24th, to p. m., 25th	6.0
Pittsboro	25th	8.0
Rockingham	25th	6.0
Roxboro	25th	6.0
Rutherford College	25-26th	1.0
Salisbury	25th	8.0
Saxon	25th	8.0
Shelby	25-26th	16.0
Soapstone Mount	25th	15.0
Southern Pines	25th	8.0
South Carolina		
Aiken	25th	3.0
Anderson	6 p. m., 24th, to 10 p. m., 25th	4.5
Camden	25-26th	4.0
Central	25th	4.0
Cheraw	25th	6.5
Clemson College	6 p. m., 24th, to 10 p. m., 25th	4.0
Conway	25th	2.2
Coronaca	24th	7.0
Cross Hill	24-25th	4.0
Edgingham	2.15 p. m., 24th, to 10 p. m., 25th	8.5
Flint Hill	Noon, 24th, to noon, 25th	5.0
Gaffney	25th	7.5
Greenville	25th	7.0
Kingston	10 a. m., 24th, to 4 p. m., 25th	3.0
Little Mountain	11 a. m., 24th, to p. m., 25th	5.8
Longshore	Noon, 24th, to p. m., 25th	5.0
McCormick	25th	3.0
Mount Carmel	9.30 a. m., 24th, to 10 p. m., 25th	3.0
Santuck	12.15 p. m., 24th, to 8 p. m., 25th	7.8
Simpsonville	7 p. m., 24th, to night, 25th	3.6
Society Hill	p. m., 24th, to p. m., 25th	3.0
Statesburg	24th	7.0
Trenton	10.40 a. m., 24th, to 2.20 p. m., 25th	4.8
Yorkville	25th	8.0
Texas		
Brownwood	24th	1.2
Dallas	24-25th	3.0
Gainesville	24th	1.0
Grape Vine	6 a. m., 24th, to midnight	2.5
Hartley	24th	2.0
Temple	23d	1.0
Waco	24th	2.5

By plotting upon a chart the times at which snowfall began it will be seen that on the morning of the 24th snow began on the southern border of Oklahoma, and spread very slowly to the southwest but much more rapidly eastward. This eastward progress was of course due to the general cooling of the moist air before sunrise, so that at 8 a. m. it had already begun snowing at points in southeastern Oklahoma, southern Arkansas, northern Mississippi and Alabama, and northern and eastern Georgia. During the daytime of the 24th the cold northerly wind of northern Arkansas barely overcame the warmth of the solar heat, and the line of snowfall moved very slowly northward. In the south Atlantic States the progress northward was a little more rapid, and in the high lands of Virginia, Kentucky, Tennessee, and North Carolina still more rapid, while on the immediate seacoast line it was less so.

The southward movement of the area of snowfall in Texas must be attributed to the flow of cold, dry air southward in the rear of the barometric depression; the northward movement of the area of snowfall along the Atlantic coast and Appalachian range is attributable to the cooling of the clouds by radiation, especially at nighttime, thus converting into snow that which would otherwise have fallen as rain.

DEPTH OF SNOW ON GROUND.

The depth of unmelted snow lying on the ground at 8 p. m. Monday of each week during the winter season is shown by a series of weekly maps published by the Weather Bureau, based upon telegraphic reports received from a comparatively few selected stations. These maps may be summarized as follows:

5th.—Maximum depths were 30 inches near Marquette, Mich., and over 20 inches in northern New Hampshire, Vermont, and Maine; the southern limit passed from Delaware westward along the southern border of Pennsylvania, Ohio, Indiana, Illinois, Iowa, and South Dakota, thence southward through Colorado into New Mexico; none was reported on the ground in the western portions of the Pacific coast States.

12th.—Maximum depths, 35 or 36 inches near Marquette, Mich.; 25 inches in northern New Hampshire and Maine; 15 inches in western Missouri; 9 inches in the eastern portion of South Dakota. The southern limit passed from Delaware southwest to northern Texas, thence northwest into Utah and Oregon, having been pushed farther south over the whole of Missouri, Nebraska, Kansas, and Oklahoma by the heavy snowfall of the past week.

19th.—Maximum depths, 35 or 36 inches near Marquette, Mich.; 25 inches in northern New Hampshire, Vermont, and Maine; 9 inches in Idaho. The southern limit extended from New Jersey to southern Kansas, thence northwestward into California and Oregon, having been appreciably broken up in Nevada, Utah, Colorado, Oklahoma, Texas, Missouri, and the Ohio Valley.

26th.—Maximum depths, 35 inches near Marquette, Mich.; 25 inches in northern New York, Vermont, New Hampshire, and Maine; 12 inches in Connecticut; 6 inches in Idaho. No snow was reported in central Indiana, southern Illinois, and southern Missouri, nor Nebraska, western Kansas, Oklahoma, and eastern Colorado. The southern limit was carried far southward by the heavy snows of February 25 and 26, and now extended from Norfolk southwest to central Georgia, thence northwest to central Oklahoma, northeast to southeastern Minnesota, west to central Wyoming, and south into New Mexico.

The accompanying chart, No. VI, gives the depth, in inches, of snow lying on the ground on February 28 at many stations, selected from among those that report the presence of more or less snow at the close of the day. The warm weather of the 27th and 28th caused a rapid melting, so that the charts of the 26th and 28th show remarkable differences.

The accompanying table shows both the total snowfall and the depth of snow on the ground on the 15th and 28th of the month:

Snowfall of 10 inches or more, February, 1894, with amounts on ground on the 15th and at the close of the month.

State and station.	Total.	15th.	28th.	State and station.	Total.	15th.	28th.
<i>Alabama.</i>	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>Idaho—Cont'd.</i>	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>
Madison.....	11.0	.....	.....	Idaho Falls.....	11.8	3.5	6.0
Scottsboro.....	11.5	0.0	T.	Kootenai.....	15.0	.....	.....
<i>Arizona.</i>				Martin.....	32.0	.....	.....
Flagstaff.....	24.0	.....	.....	Murray.....	39.0	.....	.....
Natural Bridge.....	12.0	2.0	.....	Paris.....	.....	12.0	14.0
Payson.....	13.0	0.0	0.0	Salubria.....	19.0	15.5	19.0
Saint Helena Ranch.....	14.0	10.0	0.0	Soldier.....	32.5	30.0	35.0
Walnut Ranch.....	11.0	.....	.....	<i>Illinois.</i>			
Wilgus.....	10.0	.....	.....	Aurora.....	10.3	.....	.....
<i>California.</i>				Beardstown.....	14.0	.....	.....
Boca.....	75.5	.....	.....	Chicago.....	12.9	10.0	0.0
Cisco.....	180.5	.....	.....	Decatur.....	12.4	11.0	.....
Davisville.....	27.1	.....	.....	Dixon.....	12.0	.....	.....
Dunsmuir.....	32.0	.....	.....	Fort Sheridan.....	15.0	.....	.....
Edmonton.....	118.0	66.0	70.0	Havana.....	11.5	6.0	0.0
Emigrant Gap.....	155.0	.....	.....	Lagrange.....	12.0	10.0	0.0
Georgetown.....	15.0	0.0	0.0	Mount Pulaski.....	10.2	7.0	0.0
Girard.....	13.0	.....	.....	Rockford.....	13.0	.....	.....
Gormans Station.....	13.2	.....	.....	Springfield.....	12.1	9.6	T.
Green Valley.....	10.0	.....	.....	Walnut.....	11.0	7.2	T.
Iowa Hill.....	14.5	3.0	0.0	<i>Indiana.</i>			
Lick Observatory.....	20.0	.....	.....	Butlerville.....	11.0	3.5	.....
Mariposa.....	11.0	.....	.....	Connersville.....	10.2	5.0	0.0
Shasta Springs.....	22.2	8.0	0.0	Degonia Springs.....	11.5	4.0	0.0
Summit.....	152.5	.....	.....	Delphi.....	12.9	13.0	T.
Susanville.....	21.5	.....	.....	Farmland.....	16.0	.....	.....
Tehachapi.....	10.0	.....	.....	Hammond.....	15.0	7.0	0.0
Truckee.....	109.5	.....	.....	Hawpach.....	14.0	.....	.....
Weaverville.....	20.0	7.0	0.0	Huntington.....	12.0	6.0	T.
West Point.....	21.0	5.0	0.0	Jeffersonville.....	12.2	2.2	0.0
<i>Colorado.</i>				Kokomo.....	10.0	8.0	0.0
Akron.....	11.0	3.0	0.0	Laconia.....	14.0	2.0	.....
Arboles.....	22.0	6.0	2.0	Madison.....	10.0	3.0	.....
Avoca.....	11.0	0.0	0.0	Marengo.....	11.0	2.0	.....
Breckenridge.....	.....	50.0	60.0	Marion.....	12.0	12.0	.....
Canyon.....	21.0	0.0	3.0	Markle.....	14.2	12.0	1.0
Castle Rock.....	10.5	.....	.....	Mauzy.....	10.2	.....	.....
Cheyenne Wells.....	13.0	.....	.....	Mount Vernon.....	10.0	4.0	0.0
Climax.....	47.0	72.0	70.0	Muncie.....	10.3	9.0	0.0
Colbran.....	18.2	.....	9.0	New Albany.....	11.5	1.8	.....
Denver.....	11.9	0.2	0.0	Rockville.....	10.5	.....	.....
Divide Ex. Station.....	13.2	3.0	T.	Seymour.....	10.0	5.0	.....
Downing.....	11.7	0.0	3.0	South Bend.....	12.8	10.0	.....
East Dale.....	12.0	2.0	5.0	Valparaiso.....	16.0	.....	.....
Glenwood Springs.....	11.2	4.0	0.0	<i>Indian Territory.</i>			
Gold Hill.....	11.0	5.0	4.0	South McAlester.....	11.5	.....	.....
La Jara.....	16.5	2.0	5.0	<i>Iowa.</i>			
Lay.....	12.0	8.0	12.0	Atlantic.....	11.5	4.5	0.0
McCoy.....	12.0	17.0	22.0	Carroll.....	10.0	4.0	0.0
Manhattan.....	10.0	.....	.....	Cedar Rapids.....	12.1	6.0	T.
Meeker.....	14.5	6.0	4.0	Clarinda.....	12.2	10.0	.....
Minneapolis.....	13.0	.....	.....	College Springs.....	11.5	10.0	1.0
Monte Vista.....	14.5	.....	.....	Corning.....	14.0	10.0	0.0
Moraine.....	12.5	.....	3.0	Des Moines.....	13.0	6.2	T.
Pagoda (near).....	30.0	15.0	24.0	Dubuque.....	11.5	9.0	T.
Pavonia.....	13.5	2.0	4.0	Fairfield.....	15.5	6.0	0.0
Pikes Peak.....	21.1	6.3	1.0	Fort Madison.....	10.5	4.0	T.
Pueblo.....	20.1	0.0	0.0	Glenwood.....	11.0	10.0	0.0
Rico.....	28.9	.....	.....	Hawkeye.....	11.3	3.0	0.0
River Bend.....	12.0	.....	.....	Hopeville.....	12.0	10.0	.....
San Luis.....	13.1	2.0	1.0	Iowa City.....	15.8	0.5	T.
Scissors.....	23.0	6.0	4.0	Keosauqua.....	12.0	12.0	0.0
Seibert.....	10.0	0.0	0.0	Knoxville.....	13.0	12.0	.....
Smoky Hill Mine.....	10.0	.....	.....	Mechanicsville.....	19.5	10.0	5.0
Springfield.....	18.5	.....	.....	Ottumwa.....	10.0	9.0	0.0
Stamford.....	35.0	.....	10.0	Ovid.....	15.5	15.0	.....
Steamboat Spring.....	24.0	36.0	36.0	Richland.....	16.0	7.0	0.0
Surface Creek.....	18.0	.....	3.0	Seymour.....	14.2	6.0	0.0
T. S. Ranch.....	10.8	.....	.....	Tipton.....	13.0	10.0	T.
Vilas.....	20.0	8.0	0.0	Villisca.....	14.2	8.0	0.0
Waller.....	11.0	.....	.....	Washington.....	14.0	.....	.....
War District.....	17.0	.....	.....	Winterset.....	13.0	8.0	T.
<i>Connecticut.</i>				<i>Kansas.</i>			
Bridgeport.....	21.0	6.0	6.5	Abilene.....	12.5	2.0	.....
Canton.....	22.5	22.0	18.0	Achilles.....	11.0	5.0	0.0
Colchester.....	22.5	12.0	6.0	Allison.....	10.9	5.0	T.
Falls Village.....	17.0	16.0	7.0	Altona.....	10.5	9.0	0.0
Greenfield Hill.....	22.0	10.0	10.0	Burlington.....	16.8	14.0	0.0
Hartford.....	26.0	14.0	13.0	Columbus.....	11.5	.....	.....
Lebanon.....	29.5	10.0	.....	Concordia.....	11.7	1.2	0.0
Middletown.....	30.0	14.0	10.0	Dodge City.....	10.7	5.5	0.0
New Hartford.....	20.0	12.0	15.0	Downs.....	22.0	4.0	0.0
New Hartford.....	18.0	4.0	2.0	Elk City.....	12.8	9.0	0.0
New Haven.....	27.9	9.6	10.1	Emporia.....	17.0	.....	.....
New London.....	21.3	7.6	4.0	Eureka Ranch.....	19.4	12.0	T.
North Grosvenor Dale.....	19.0	15.0	15.0	Gove.....	12.8	3.0	0.0
Norwalk.....	18.5	6.0	5.0	Grenola.....	12.0	10.0	0.0
Southington.....	16.2	.....	.....	Hutchinson.....	11.0	0.0	0.0
South Manchester.....	26.0	13.0	14.0	Independence.....	11.8	6.0	0.0
Storrs.....	13.0	.....	.....	Johnson.....	10.8	5.0	0.0
Voluntown.....	.....	18.0	12.0	Lakin.....	12.0	.....	.....
Wallingford.....	.....	12.0	14.0	Lawrence.....	16.5	.....	.....
Waterbury.....	33.0	15.0	12.0	Lebo.....	14.8	8.0	.....
West Simsbury.....	21.0	18.0	18.0	Leoti.....	21.0	10.0	0.0
<i>Delaware.</i>				Manhattan.....	10.0	10.0	0.0
Dover.....	13.5	2.0	2.0	Manhattan.....	14.0	.....	.....
<i>District of Columbia.</i>				Marion.....	15.5	10.0	0.0
Washington.....	18.1	T.	1.5	Marmaton.....	11.5	.....	.....
<i>Idaho.</i>				Morland.....	12.0	8.0	0.0
American Falls.....	14.0	.....	.....	Morton.....	10.0	6.0	0.0
Atlanta.....	36.0	.....	.....	Mount Hope.....	13.5	.....	.....
Chesterfield.....	7.0	16.0	20.0	Norton.....	12.0	.....	.....
Egin.....	13.5	13.0	12.0	Oberlin.....	10.5	.....	.....
Garden Valley.....	30.0	.....	.....	Olathe.....	18.0	8.0	.....
Grangeville.....	13.2	10.0	3.0	Oswego.....	11.0	8.0	.....
Hailey.....	39.5	.....	.....	Phillipsburg.....	14.0	.....	.....
Idaho City.....	18.5	.....	.....	Pleasant Dale.....	12.0	4.0	0.0

Snowfall of 10 inches or more—Continued.

State and station.	Total.	15th.	25th.	State and station.	Total.	15th.	25th.
<i>Kansas—Cont'd.</i>	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>Michigan—Cont'd.</i>	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>
Quinter	12.0	.....	.....	Ball Mountain.....	14.2	.....	11.0
Rome	10.7	10.0	0.0	Benton Harbor.....	18.2	13.0	0.0
Sedan	12.0	10.2	0.0	Benzonia.....	23.0	9.0	0.0
Tribune.....	15.0	7.0	.....	Berlin.....	13.7	10.0	T.
Wallace.....	14.0	.....	.....	Berrien Springs.....	20.0	8.0	0.0
Wamego.....	10.0	10.0	0.0	Berrien Springs b.	13.0	.....	0.5
Wichita.....	10.9	5.5	0.0	Birmingham.....	12.0	.....	.....
Yates Center.....	19.0	10.0	.....	Boon.....	11.5	11.0	9.0
<i>Kentucky.</i>				Brown.....	19.0	13.0	.....
Bowling Green.....	10.0	0.0	0.3	Calumet.....	14.5	54.0	54.0
Bowling Green b.	12.7	.....	.....	Cheboygan.....	11.0	15.0	14.0
Catlettsburg.....	12.0	3.0	2.0	Detroit.....	14.6	14.1	T.
Earlington.....	11.5	3.0	.....	Fairview.....	12.2	.....	.....
Edmonton.....	12.0	2.0	1.0	Fitchburg.....	21.0	12.0	1.0
Elizabethtown.....	10.5	2.0	0.0	Grand Rapids.....	6.8	20.0	0.0
Eubank.....	10.5	3.0	0.0	Grape.....	13.5	12.0	0.0
Greendale.....	10.0	2.0	0.0	Grayling.....	12.0	.....	.....
Harrodsburg.....	11.9	3.2	T.	Hanover.....	12.5	12.0	T.
Hendricks.....	10.5	2.0	.....	Harbor Springs.....	13.0	20.0	18.0
Lexington.....	14.7	2.8	0.0	Harrisville.....	12.7	.....	.....
Louisia.....	11.5	2.0	3.0	Hastings.....	12.9	.....	.....
Louisville.....	10.2	1.7	T.	Jeddo.....	17.0	4.0	0.0
Mount Sterling.....	10.0	0.0	0.0	Lansing.....	10.0	7.0	T.
Pellville.....	15.5	3.0	2.0	Lathrop.....	6.2	34.0	30.0
Shelbyville.....	12.5	4.5	0.0	Lodi.....	11.5	6.0	4.0
South Fork.....	15.0	2.5	10.5	Madison.....	10.5	8.0	2.0
<i>Maine.</i>				Marquette.....	20.3	36.7	30.7
Bar Harbor.....	25.0	24.0	7.0	Parkville.....	12.0	1.0	0.0
Belfast.....	20.0	28.0	24.0	Port Huron.....	15.4	13.3	0.8
Calais.....	15.0	38.0	32.0	Rawsonville.....	12.0	4.0	0.0
Cornish.....	23.5	.....	26.0	Sault Ste. Marie.....	5.2	21.0	22.0
East Machias.....	11.0	26.0	12.0	Stanton.....	2.0	20.0	.....
Eastport.....	10.1	8.6	3.6	Vandalia.....	12.1	30.0	1.0
Fairfield.....	12.0	30.0	28.0	Williamston.....	15.0	10.0	0.0
Farmington.....	22.2	.....	36.0	Ypsilanti.....	10.5	8.0	.....
Gardiner.....	18.0	28.0	18.0	<i>Minnesota.</i>			
Houlton.....	15.0	42.0	36.0	Ada.....	0.4	28.0	4.0
Indian Stream.....	10.0	34.0	36.0	Alexandria b.	0.2	10.0	8.0
Kents Hill.....	12.0	.....	.....	Bonniwells Mills.....	T.	12.0	.....
Lewiston.....	24.1	.....	.....	Caledonia.....	10.6	7.0	2.0
Madison.....	22.0	49.0	50.0	Cambridge.....	T.	10.0	.....
North Bridgton.....	25.5	36.0	47.0	Clearwater.....	.....	11.2	10.1
Orono.....	15.0	18.0	15.0	Collegeville.....	.....	15.0	12.0
Portland.....	25.2	44.8	25.2	Excel.....	5.0	13.0	10.0
<i>Massachusetts.</i>				Farmington.....	0.5	14.0	10.0
Adams.....	20.0	22.0	7.0	Lake Winnibigoshish.....	1.4	15.5	13.5
Amherst.....	16.5	.....	.....	Leech Lake.....	2.0	14.0	14.0
Amherst Ex. Station a	18.2	.....	6.0	Long Prairie.....	0.2	.....	12.0
Amherst Ex. Station b	19.0	.....	5.0	Maple Plain.....	1.0	16.0	9.0
Andover.....	26.0	.....	.....	Marfield.....	1.8	19.0	17.0
Bedford.....	19.0	24.0	15.0	Pokegama Falls.....	2.0	12.0	11.0
Beverly Farms.....	28.0	22.0	10.0	Red Lake.....	3.6	16.0	12.5
Blue Hill (summit).....	25.0	19.0	8.0	Rush City.....	0.5	22.0	16.0
Boston.....	21.6	10.0	T.	Sandy Lake Dam.....	2.4	10.0	5.0
Brookton.....	26.0	6.0	3.0	Sauk Center.....	T.	10.0	3.0
Cambridge.....	22.0	9.0	9.0	Sunrise City.....	2.5	28.0	18.0
Chestnut Hill.....	19.5	21.5	12.0	<i>Missouri.</i>			
Clinton.....	19.0	6.0	6.0	Akron.....	16.0	16.0	0.0
Concord.....	22.5	22.0	4.0	Appleton City.....	15.0	7.0	0.0
Dudley.....	27.5	18.0	3.0	Arthur.....	10.0	8.0	0.0
East Templeton.....	29.2	24.0	18.5	Bethany.....	13.0	13.0	0.0
Fall River.....	28.5	12.0	4.0	Big Prairie.....	13.0	.....	.....
Fiskdale.....	18.0	.....	.....	Boonville.....	15.0	.....	.....
Fitchburg a.....	23.0	24.0	11.0	Brunswick.....	16.5	.....	.....
Fitchburg b.....	21.0	24.0	12.0	Carrollton.....	19.0	14.0	T.
Gilbertville.....	30.0	20.0	8.0	Cowgill.....	13.0	12.0	0.0
Groton a.....	26.0	30.0	18.0	Darksville.....	13.0	.....	0.0
Hingham.....	27.0	.....	.....	Downing.....	15.2	10.0	.....
Hyannis.....	21.5	.....	3.0	Emma.....	14.0	.....	.....
Kendall Green.....	18.0	.....	5.0	Fairport.....	12.0	12.0	T.
Lawrence.....	26.2	15.0	2.0	Farmersville.....	16.0	.....	.....
Leeds.....	23.0	22.0	12.0	Fayette.....	18.5	15.0	T.
Leominster.....	20.2	22.0	10.0	Fox Creek.....	14.0	10.0	T.
Long Plain.....	22.0	11.0	5.0	Fulton.....	10.0	8.0	0.0
Ludlow Center.....	18.5	15.0	8.0	Gallatin.....	19.8	17.0	0.0
Mansfield.....	23.0	15.0	6.0	Glasgow.....	19.0	14.0	T.
Middleboro.....	22.5	12.0	3.0	Gorin.....	11.0	11.0	T.
Milton.....	20.5	.....	.....	Half Way.....	12.5	5.0	0.0
Monroe.....	30.5	38.0	24.0	Hastain.....	14.5	12.5	.....
Monson.....	22.0	18.0	3.0	Jefferson City.....	16.0	.....	.....
Mount Nonotuck.....	20.8	23.0	15.0	Kansas City.....	17.1	12.0	0.0
Nantucket.....	17.5	1.0	1.0	Kidder.....	18.5	17.5	T.
New Bedford a.....	14.0	.....	.....	Lamar.....	15.5	5.5	.....
New Bedford b.....	19.0	7.0	3.0	Lamonte.....	10.0	8.0	.....
North Billerica.....	23.0	24.0	0.0	La Plata.....	10.0	10.0	T.
Plymouth.....	21.0	.....	.....	Lebanon.....	12.0	5.0	0.0
Provincetown.....	10.5	3.0	1.0	Lexington.....	19.0	13.5	.....
Randolph.....	27.0	19.0	T.	Liberty.....	12.8	11.0	0.0
Roberts Dam.....	23.0	.....	.....	Louisiana Bridge.....	10.0	.....	.....
Roxbury.....	21.5	16.0	3.0	McCune.....	13.0	13.0	T.
Royalston.....	25.9	24.0	.....	Marceline.....	23.0	15.0	.....
Salem.....	20.0	.....	.....	Marshall.....	18.0	.....	.....
Salisbury.....	18.0	16.0	5.0	Mexico.....	16.6	.....	.....
Somerset.....	26.5	15.0	8.0	Neosho.....	10.2	4.0	.....
South Dennis.....	15.0	2.0	1.0	New Boston.....	14.0	12.0	.....
Springfield.....	19.0	.....	.....	New Hartford.....	10.0	10.0	0.0
Taunton b.....	24.0	12.0	4.0	New Haven.....	20.0	8.0	.....
Turners Falls.....	21.0	.....	.....	New Palestine.....	10.0	11.0	0.0
Vineyard Haven.....	15.8	.....	.....	Oregon a.....	13.2	10.0	T.
Wakefield.....	21.5	16.0	8.0	Oregon b.....	11.5	9.0	T.
Webster.....	24.2	13.0	7.0	Palmyra.....	11.0	10.0	T.
Westboro.....	25.0	30.0	24.0	Paris.....	13.0	12.0	0.0
Winchendon.....	23.0	26.0	18.0	Pickering.....	10.2	10.0	1.5
Winthrop.....	28.8	12.0	2.0	Platte River.....	15.5	.....	T.
Woods Holl.....	28.3	3.0	1.1	Princeton.....	14.0	20.0	T.
Worcester.....	27.0	14.0	5.0	Saint Joseph.....	11.0	8.0	0.0
<i>Michigan.</i>				Sedalia.....	17.8	12.0	T.
Ann Arbor.....	10.2	9.0	T.	Shelbina.....	12.0	12.0	.....

Snowfall of 10 inches or more—Continued.

State and station.	Total.	15th.	28th.	State and station.	Total.	15th.	28th.
Missouri—Cont'd.	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>	New Jersey—Cont'd.	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>
Springfield.....	10.5	3.0	0.0	South Orange.....	25.5	4.0	T.
Steffenville.....	17.5	10.0	T.	Tenafly.....	21.0	3.0	10.0
Stellada.....	14.0	8.0	0.0	Toms River.....	17.5	2.0	0.0
Sublett.....	14.0	12.0	0.0	Trenton.....	13.0	0.0	0.0
Unionville.....	17.0	15.0	T.	New Mexico.			
Vermont.....	12.5	12.0	0.0	Chama.....	27.0	0.0	0.0
Vilas.....	14.0	12.0	0.0	Coolidge.....	12.0	2.0	0.0
Wheatland.....	12.3	8.0	0.0	East Las Vegas.....	17.4	0.0	0.0
Whiteside.....	14.0	12.0	2.5	Fort Bayard.....	10.5	0.0	0.0
Montana.				Fort Wingate.....	18.0	0.0	0.0
Choteau.....	10.3	3.0	0.0	Gallinas Spring.....	10.0	1.0	0.0
Cokedale.....	20.0	0.0	0.0	Halls Peak.....	15.7	2.5	1.0
Powder River.....	T.	10.0	2.0	Las Cruces.....	17.0	0.0	0.0
Nebraska.				Monero.....	10.5	12.0	6.0
Ashland.....	10.5	8.0	0.0	Pojuaque.....	10.3	0.0	0.0
Fairbury.....	12.0	4.0	0.0	Santa Fe.....	13.3	1.5	0.0
Geneva.....	10.5	10.0	2.0	New York.			
Lexington.....	11.0	6.0	0.0	Addison.....	14.0	12.0	0.0
Lincoln.....	10.4	3.0	0.0	Albany.....	24.7	17.5	1.0
Minden.....	11.2	10.0	0.0	Alfred Center.....	26.0	22.0	T.
Nebraska City.....	14.0	0.0	0.0	Angelica.....	24.5	15.0	8.0
Omaha.....	10.0	7.5	T.	Arcade.....	20.0	14.0	8.0
State Farm.....	10.4	3.0	0.0	Baldwinsville.....	19.0	13.0	5.0
Weeping Water.....	15.0	0.0	T.	Binghamton.....	22.5	14.0	0.0
York.....	10.0	0.0	0.0	Brentwood.....	19.2	0.0	0.0
Neveda.				Brookfield.....	31.0	18.0	16.0
Austin.....	26.0	15.0	T.	Buffalo.....	27.3	12.0	0.7
Ball Mountain.....	12.5	T.	2.0	Cooperstown.....	16.0	8.0	5.0
Belmont.....	16.0	14.0	6.0	Factoryville.....	25.7	17.0	6.0
Carson City (W.B.).....	25.6	5.0	0.0	Fleming.....	15.0	10.0	5.0
Carson City (V.O.).....	23.6	9.4	0.0	Friendship.....	24.2	18.0	6.0
Cranes Ranch.....	17.0	10.0	12.0	Glen Falls.....	24.0	16.0	0.0
Edgewood.....	70.0	42.0	43.2	Gloversville.....	31.1	21.0	17.5
Elko (near).....	10.0	8.0	4.0	Hess Road Station.....	11.0	8.0	0.0
Ely.....	25.0	14.0	3.0	Honeymead Brook.....	20.9	18.0	21.0
Empire Ranch.....	19.0	14.0	4.0	Humphrey.....	18.0	12.0	12.0
Eureka.....	20.5	0.0	0.0	Ithaca.....	21.5	14.0	3.0
Genoa.....	19.0	17.0	2.0	Lebanon Springs.....	31.5	30.0	10.0
Gold Hill.....	49.0	0.0	3.0	Le Roy.....	42.1	22.0	14.0
Halleck.....	15.5	0.0	0.0	Lockport.....	14.0	10.0	4.0
Lewes Ranch.....	39.0	24.0	12.0	Lowville.....	29.0	24.0	24.0
McGill.....	11.2	0.0	0.0	Madison Barracks.....	14.0	0.0	0.0
Oscola.....	23.7	0.0	0.0	Malone.....	15.0	12.0	2.0
Palisade.....	28.0	2.0	0.0	Middletown.....	32.5	16.0	5.0
Palmetto.....	10.0	6.0	0.0	New Lisbon.....	19.8	16.0	5.0
Paradise.....	10.0	1.0	0.0	New York.....	37.9	5.5	2.7
South Camp.....	37.8	8.0	0.0	Number Four.....	34.3	26.0	23.0
Stofel.....	25.0	16.0	18.0	Oswego.....	30.4	12.5	8.0
Tybo.....	14.0	16.0	10.0	Oxford.....	18.8	0.0	0.0
Virginia City.....	56.7	8.0	8.0	Palermo.....	30.8	10.0	18.0
Winnemucca.....	11.3	1.3	0.0	Perry City.....	22.6	18.0	13.0
New Hampshire.				Port Jervis.....	32.0	12.0	6.0
Alstead.....	21.2	19.0	16.0	Potsdam.....	17.0	0.0	0.0
Antrim.....	31.5	0.0	0.0	Poughkeepsie.....	21.0	8.0	6.0
Berlin Mills.....	22.8	40.0	23.0	Rochester.....	29.5	17.0	5.6
Bethlehem.....	21.0	38.0	22.0	Romulus.....	20.4	19.4	8.0
Brookline.....	30.0	36.0	30.0	Rondout.....	25.1	0.0	0.0
Concord.....	22.0	36.0	20.0	Saranac Lake.....	20.0	15.0	12.0
Dublin.....	28.0	36.0	30.0	Setauket.....	20.0	5.0	4.0
East Canterbury.....	22.0	46.0	18.5	South Canisteo.....	27.7	20.8	8.0
Grafton.....	35.0	24.0	24.0	Stillwater.....	29.5	13.0	6.0
Hanover.....	37.0	29.0	9.0	Turin.....	35.7	24.0	21.0
Keene.....	19.0	20.0	7.0	Varysburg.....	22.2	20.0	4.0
Lancaster.....	18.0	28.0	24.0	Wappingers Falls.....	23.5	18.0	10.0
Littleton.....	23.2	32.0	24.0	Watertown.....	18.4	9.0	3.0
Nashua.....	25.2	12.0	0.0	Wedgwood.....	29.5	24.0	24.0
Newton.....	22.0	0.0	0.0	West Point.....	25.0	0.0	0.0
North Conway.....	28.0	0.0	0.0	Willets Point.....	25.5	0.0	0.0
Peterboro.....	31.0	36.0	18.0	North Carolina.			
Plymouth.....	27.3	42.0	30.0	Bailey.....	13.0	0.0	0.0
Sanbornston.....	26.0	31.0	25.0	Bakersville.....	19.0	2.0	8.0
Stratford.....	18.0	0.0	0.0	Blowing Rock.....	12.0	0.0	0.0
West Milan.....	33.0	45.0	40.0	Henderson.....	10.0	0.0	T.
New Jersey.				Lenoir.....	10.2	T.	2.5
Asbury Park.....	11.8	0.0	1.0	Mocksville.....	13.0	1.0	3.0
Bayonne.....	15.0	6.0	5.0	Rutherford College.....	12.0	2.0	4.0
Belvidere.....	19.5	4.5	8.0	Salisbury.....	10.0	0.0	2.0
Beverly.....	12.8	2.5	0.0	Saxon.....	11.0	0.0	1.0
Blairstown.....	22.5	6.0	8.0	Shelby.....	16.0	0.0	16.0
Boonton.....	15.5	7.0	6.0	Soapstone Mount.....	15.0	0.0	1.0
Camden.....	11.7	2.5	1.5	North Dakota.			
Cape May C.H.....	15.0	2.0	0.0	Churchs Ferry.....	2.0	12.0	T.
Charlotteburg.....	31.0	12.0	6.0	Devils Lake.....	3.5	10.0	7.0
Chester.....	26.0	8.0	18.0	Fort Berthold.....	2.8	10.0	1.0
Deckertown.....	39.0	11.0	10.5	Fort Stevenson.....	3.5	10.0	5.0
Dover.....	24.5	8.0	12.0	Napoleon.....	4.5	10.0	5.0
Elizabeth.....	30.0	0.5	6.0	Portal.....	2.0	12.0	4.0
Franklin Furnace.....	34.5	10.0	13.0	Ohio.			
Friesburg.....	10.8	1.5	1.5	Akron.....	17.0	13.0	0.0
Gillette.....	25.0	3.0	6.0	Annapolis.....	10.3	3.9	1.0
Hightstown.....	14.5	4.0	3.0	Ashland.....	14.5	10.0	6.0
Imlaystown.....	10.5	3.5	3.0	Athens.....	17.5	2.7	3.0
Junction.....	21.5	6.0	6.0	Auburn.....	15.0	10.0	0.0
Lambertville.....	10.0	0.0	0.0	Bellefontaine.....	10.6	6.0	0.0
Millville.....	11.5	0.0	T.	Benton Ridge.....	17.7	8.0	0.0
Moorestown.....	15.3	2.0	3.0	Bethany.....	10.5	3.0	2.0
Newark.....	30.8	6.0	6.0	Big Prairie.....	19.7	5.0	0.0
Newark.....	13.9	3.5	3.0	Binola.....	20.5	14.0	0.0
New Brunswick (W.B.).....	14.9	6.0	4.0	Bissella.....	23.1	10.4	2.0
New Brunswick (V.O.).....	14.9	0.0	0.0	Bladensburg.....	10.0	4.5	0.0
Newton.....	32.0	0.0	24.0	Bloomington.....	12.0	3.0	1.0
Oceanic.....	26.0	8.0	4.0	Bowling Green.....	13.9	12.0	6.0
Paterson.....	22.5	8.0	5.0	Caledonia.....	13.2	0.0	0.0
Pennsauken.....	11.0	1.0	1.0	Cambridge.....	12.0	2.0	0.0
Perth Amboy.....	12.8	4.0	0.0	Carrollton.....	16.0	7.0	0.0
Plainfield.....	12.8	2.3	5.1	Chicago.....	13.5	6.0	T.
Rancocas.....	14.8	1.0	3.0	Cincinnati.....	12.0	3.0	T.
River Vale.....	26.0	0.0	0.0	Circleville.....	10.0	6.0	10.0

Snowfall of 10 inches or more—Continued.

State and station.	Total.	15th.	28th.	State and station.	Total.	15th.	28th.
Ohio—Cont'd.	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>	Pennsylvania.	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>
Cleveland (W. B.).....	14-3	9.0	0.0	Aqueduct.....	27.4	7.5	6.0
Cleveland (V. O.).....	12-6	8.0	T.	Beaver Dam.....	12.0	7.0	.....
Coalton.....	18-5	3.0	4.0	Blooming Grove.....	34-0	16.0	20.0
Colebrook.....	12-5	8.0	T.	Bloomsburg.....	15.7	8.0	3.0
Columbus.....	13-1	3.5	T.	Blue Knob.....	38.5	20.0	18.0
Cynthiana.....	18-0	3.5	8.0	Carlisle.....	32.0	6.0	8.0
Ellsworth.....	14-7	7.0	.....	Clarion.....	18.8	9.0	.....
Elyria.....	12-6	.....	.....	Coatesville.....	23.0	8.0	6.0
Findlay.....	14-0	14.0	.....	Confidence.....	29.0	6.0	3.0
Fostoria.....	10-4	9.0	T.	Coopersburg.....	17.7	7.0	9.0
Frankfort.....	12-0	1.5	0.5	Drifton.....	34-0	5.0	11-0
Garrettsville.....	17-3	10.0	T.	Dubois.....	24.9	.....	.....
Georgetown.....	13-4	3.0	.....	Dyberry.....	30.0	20.0	20.0
Gratiot.....	17-0	3.0	T.	East Mauch Chunk.....	20.5	6.0	4-0
Green Hill.....	14-5	10.5	T.	Easton.....	18.6	.....	.....
Greenville.....	14-5	7.0	.....	Edinboro.....	18.0	8.0	2.0
Guyville.....	14-5	2.0	3.0	Elwood Junction.....	13.5	8.0	0.0
Hackney.....	13-2	.....	.....	Emporium.....	18.3	11.0	T.
Hanging Rock.....	11-7	3.0	T.	Erie.....	21.4	16.0	0.0
Harbor.....	12-3	9.0	0.0	Freeport.....	25.0	9.0	.....
Hedges.....	11-9	9.5	T.	Gettysburg.....	21.5	.....	.....
Hillhouse.....	15-5	11.5	0.0	Grampian.....	22.0	15.0	6.0
Hillsboro.....	11-0	2.5	0.5	Greensburg.....	10.0	.....	.....
Hiram.....	13-0	9.0	T.	Greenville.....	10.5	3.0	0.0
Jacksonboro.....	12-0	4.0	.....	Hamburg.....	29.5	.....	12.0
Kenton.....	12-5	9.5	7.5	Harrisburg.....	23.5	13.5	4.0
Leipsic.....	10-9	9.0	0.0	Hollidaysburg.....	26.0	7.0	5.0
Levering.....	10-2	6.0	0.0	Honesdale.....	32.0	20.0	24.0
Logan.....	11-8	2.0	T.	Huntingdon.....	25.3	12.0	3.0
Lordstown.....	13-2	7.5	0.0	Johnstown.....	23.0	6.0	1.0
Lowell.....	13-5	2.0	0.0	Kane.....	14.7	17.0	6.0
McArthur.....	12-6	2.0	.....	Kennett Square.....	19.0	3.0	3.0
McConnellsville.....	14-7	2.0	.....	Kilmer.....	37.3	12.0	8.0
Mansfield.....	11-8	.....	.....	Lancaster.....	22.8	7.5	7.0
Marietta a.....	13-0	3.0	5.0	Lebanon.....	25.2	13.0	4.0
Marietta b.....	13-7	3.0	.....	Le Roy.....	24.7	18.0	8.0
Milligan.....	13-0	T.	T.	Lewisburg.....	22.5	12.0	4.0
Millport.....	14-5	9.0	1.0	Ligonier.....	26.0	8.0	1.0
Montpelier.....	12-5	1.5	.....	Lock Haven.....	34.0	9.0	1.0
Napoleon.....	11-0	8.0	.....	Lock No. 4.....	16.0	4.0	T.
Nelsonville.....	18-6	2.5	.....	Lycippus.....	19.0	.....	.....
New Alexandria.....	15-0	4.0	T.	Mahoning.....	16.0	10.0	.....
New Berlin.....	12-0	2.0	.....	Newcastle.....	11.0	.....	.....
New Bremen.....	13-6	10.6	T.	Oil City.....	15.3	11.0	1.0
New Holland.....	13-0	3.0	T.	Philadelphia (W. B.).....	11.5	1.8	1.0
North Lewisburg.....	10-5	3.0	0.0	Philadelphia a.....	12.9	1.5	3.0
Oberlin.....	13-2	11.0	0.0	Philadelphia b.....	12.3	1.5	1.5
Ohio State University.....	12-4	2.8	T.	Phoenixville.....	23.5	6.0	6.0
Orangeville.....	10-5	6.0	.....	Pittsburg.....	20.5	9.0	T.
Pataskala.....	12-8	4.0	0.0	Pottstown.....	19.5	.....	3.0
Plattsburg.....	11-0	3.0	T.	Quakertown.....	16.5	3.0	10.0
Pomeroy.....	14-3	2.0	T.	Ridgway.....	14.5	.....	.....
Portsmouth a.....	13-0	4.0	0.0	Saegertown.....	10.5	10.0	0.0
Portsmouth b.....	12-0	3.0	T.	Salem Corners.....	42.3	28.0	30.0
Ridge.....	20.6	3.0	3.0	Saltsburg.....	24.0	5.0	.....
Ridgeville Corners.....	11.5	8.0	1.0	Selins Grove.....	28.8	9.0	10.0
Rittman.....	10.0	6.0	0.0	Shinglehouse.....	21.0	16.0	6.0
Sandusky.....	17.5	13.2	T.	Smethport.....	15.5	.....	.....
Shenandoah.....	10.0	8.0	0.5	Somerset.....	40.0	7.0	3.0
Sidney.....	11.5	5.0	.....	South Eaton.....	29.0	10.0	1.0
Sylvania.....	16.0	16.0	.....	Stoyestown.....	31.0	.....	.....
Thurman.....	22.0	4.0	5.0	Swarthmore.....	16.2	.....	6.0
Tiffin.....	16.7	13.0	T.	Uniontown.....	15.0	.....	.....
Toledo.....	10.2	7.3	0.5	Warren.....	.....	14.0	5.0
Van Wert.....	11.2	9.0	T.	Wellsboro.....	19.0	14.5	10.5
Vermillion.....	18.5	2.5	3.0	West Chester.....	18.0	3.0	3.0
Victory.....	13.0	10.0	T.	West Newton.....	22.0	6.0	0.0
Warren.....	18.5	8.0	T.	Westtown.....	12.2	3.0	3.0
Wauseon.....	14.7	8.5	2.0	Wilkesbarre.....	25.0	15.0	T.
Waverly.....	13-3	3.0	T.	York.....	25.2	8.0	5.0
Waynesville.....	11.0	.....	.....	Rhode Island.	.....	.....	.....
Wellington.....	23.0	6.0	2.0	Bristol.....	20.0	12.0	3.0
Weymouth.....	16.0	9.0	T.	Kingston.....	24.0	15.0	10.0
Wheeler.....	27.0	14.0	.....	Lonsdale.....	21.5	15.0	6.0
Youngstown.....	15.3	8.0	0.0	Narragott Pier.....	27.0	.....	.....
Zanesville.....	12.7	2.0	1.0	Pawtucket.....	25.0	14.0	4.0
Oklahoma.	.....	.....	.....	Providence a.....	25.0	.....	.....
Buffalo.....	13.5	.....	.....	Providence b.....	19.5	8.0	2.0
Fort Supply.....	10.4	5.0	.....	South Carolina.	.....	.....	.....
Pond Creek.....	12.0	.....	.....	Columbia.....	11.3	.....	.....
Oregon.	.....	.....	.....	South Dakota.	.....	.....	.....
Ashland a.....	10.5	.....	.....	Alexandria.....	T.	10.0	3.0
Ashland b.....	13.1	.....	.....	Forestburg.....	3.0	26.0	10.0
Baker City.....	11.1	3.5	1.0	Gale.....	.....	10.0	2.0
Canyon City.....	15.5	1.0	0.0	Hot City.....	1.5	10.0	3.0
Cascade Lock.....	19.0	.....	.....	Hot Springs.....	10.4	1.0	0.0
Crook.....	17.0	3.0	5.0	Huron.....	2.4	10.0	4.3
Eugene.....	10.0	.....	.....	Oelrichs.....	22.5	10.0	0.0
Forest Grove.....	16.1	T.	0.0	Westington Springs.....	2.2	11.0	3.0
Glenora.....	29.9	5.5	9.0	Tennessee.	.....	.....	.....
Happy Valley.....	15.5	5.0	3.0	Byrdstown.....	15.5	1.5	4.0
Hood River (near).....	26.0	3.0	0.0	Carthage.....	14.0	.....	.....
Jacksonville.....	14.0	0.0	0.0	Chattanooga.....	11.5	0.1	T.
Joseph.....	10.0	10.0	8.0	Clarksville.....	11.5	1.0	0.0
Lafayette.....	10.0	.....	.....	Columbia.....	10.0	.....	.....
Lakeview.....	53.0	.....	.....	Florence Station.....	12.3	0.2	2.0
Lone Rock.....	10.0	.....	.....	Franklin.....	14.5	3.9	.....
Portland.....	10.0	0.0	0.0	Jacksboro.....	10.0	0.0	0.0
Riddles.....	11.0	.....	.....	Lynnville.....	14.0	0.0	0.0
Siskiyou.....	66.5	.....	.....	Nashville.....	10.4	0.0	T.
Sparta.....	32.0	30.0	32.0	Palmetto.....	15.0	.....	.....
Springbrook.....	14.0	0.2	6.0	Riddletton.....	16.5	1.5	1.0
Springfield.....	17.0	.....	.....	Rockwood.....	11.0	0.0	0.0
Vernonia.....	39.7	4.0	3.5	Rugby.....	18.5	1.5	2.0
West Fork.....	21.0	.....	.....	Springdale.....	11.0	0.0	4.0
Weston.....	14.0	.....	0.0	Wier.....	15.5	.....	4.0
Williams.....	17.8	.....	.....	Texas.	.....	.....	.....
				Amarillo.....	11.5	0.5	0.0

Snowfall of 10 inches or more—Continued.

State and station.	Total.	15th.	28th.	State and station.	Total.	15th.	28th.
<i>Utah.</i>	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>Washington—Cont'd.</i>	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>
Blue Creek.....	12.0	.....	.....	Port Angeles.....	12.8	0.0	0.0
Castle Gate.....	11.5	1.5	0.0	Port Crescent.....	16.5	.....	.....
Coalville.....	11.6	.....	.....	Seattle.....	10.0	0.0	0.0
Corinne.....	19.0	.....	.....	Silver Creek.....	18.6	0.0	0.0
Deseret.....	13.5	.....	.....	Snohomish.....	10.0	0.0	0.0
Glendale.....	15.0	.....	.....	Sunnyside.....	14.5	4.0	0.0
Grouse Creek.....	12.8	6.7	9.0	Union City.....	14.5	.....	.....
Heber.....	15.0	22.0	20.0	Waterville.....	11.0	.....	.....
Levan.....	15.5	17.0	16.0	Wenatchee Lake.....	44.0	.....	.....
Logan.....	14.5	.....	.....	<i>West Virginia.</i>			
Ogden.....	10.2	.....	.....	Beverly.....	37.5	6.0	10.0
Promontory.....	11.5	.....	.....	Bloomery.....	27.4	4.0	13.0
Provo City.....	15.0	8.0	2.0	Bluefield.....	13.5	2.5	2.0
Randolph.....	12.6	6.0	12.0	Buchannon.....	24.2	.....	.....
Salt Lake City.....	14.3	1.0	0.6	Burlington.....	24.0	4.0	15.0
Silver Lake.....	47.0	78.0	8.6	Central Station.....	19.0	4.6	6.0
Singletree.....	16.0	.....	.....	Charleston.....	15.0	.....	4.0
Snowville.....	10.0	.....	.....	Charlestown.....	16.5	4.0	5.0
Soldier Summit.....	22.0	36.0	48.0	Cloverdale.....	14.0	1.0	6.0
Thistle.....	22.5	.....	.....	Davis.....	32.9	1.0	4.0
<i>Vermont.</i>				Elkhorn.....	16.5	3.0	4.0
Brattleboro.....	17.3	.....	.....	Fairmont.....	15.0	1.0	3.0
Burlington.....	13.0	10.0	4.0	Glenville.....	19.5	1.0	4.0
Cornwall.....	34.0	15.0	12.0	Grafton.....	21.3	3.0	5.0
Enosburg Falls.....	16.0	.....	.....	Harpers Ferry.....	16.0	4.0	4.0
Hartland.....	26.2	26.0	19.0	Hinton.....	18.0	1.0	8.0
Iraaburg.....	34.0	48.0	38.0	Marlinton.....	18.0	2.0	6.0
Jacksonville.....	20.3	19.0	12.0	Martinsburg.....	17.5	3.0	6.0
Northfield.....	22.5	35.6	27.6	Morgantown.....	14.0	2.0	3.0
Norwich.....	31.0	28.0	25.0	Parkersburg (W. B.).....	25.7	5.0	0.2
Stratford.....	41.5	42.0	30.0	Parkersburg (V. O.).....	18.0	4.0	3.0
Vernon.....	25.0	.....	.....	Phillipi.....	12.0	.....	8.0
Wells.....	20.0	18.0	12.0	Pleasant Hill.....	35.0	10.0	12.0
Woodstock.....	30.0	22.0	15.0	Point Pleasant.....	16.0	3.0	16.0
<i>Virginia.</i>				Raleigh.....	30.8	2.3	6.0
Abingdon.....	13.0	.....	.....	Rowlesburg.....	24.0	4.0	4.0
Alexandria.....	11.0	2.0	0.0	Sandyville.....	17.6	1.8	2.0
Avon.....	10.0	.....	.....	Spencer.....	15.5	0.5	1.0
Bedford City.....	12.5	.....	2.0	Tannery.....	27.2	6.0	2.0
Big Stone Gap.....	10.5	T.	3.0	Weston.....	21.5	1.0	4.0
Charlottesville.....	18.5	.....	.....	Weston.....	18.0	.....	.....
Christiansburg.....	10.0	.....	.....	Wheeling.....	14.1	4.3	?
Clarksville.....	10.0	0.0	0.5	<i>Wisconsin.</i>			
Dale Enterprise.....	19.5	2.0	4.0	Amherst.....	6.0	10.0	6.0
Falls Church.....	12.8	T.	.....	Ashland.....	18.8	.....	.....
Hot Springs.....	14.0	1.0	6.0	Barron.....	4.5	12.0	9.0
Lexington.....	11.2	.....	4.0	Bayfield.....	11.0	40.0	38.0
Lynchburg.....	12.5	0.0	0.4	Butternut.....	3.5	33.0	30.0
Riverton.....	24.0	.....	6.0	Centralia.....	5.0	10.0	2.5
Salem.....	10.0	.....	2.5	City Point.....	4.0	10.0	4.0
Spottsville.....	10.0	0.0	T.	Columbus.....	11.0	8.0	0.0
Stanardsville.....	11.5	0.5	2.0	Crandon.....	5.0	36.0	28.0
Stanton.....	19.0	1.0	4.0	Estella.....	6.0	18.0	14.0
Stephens City.....	25.5	4.0	8.0	Florence.....	7.0	24.0	23.0
Woodstock.....	18.5	.....	.....	Grantsburg.....	2.0	19.0	14.0
Wytheville.....	16.5	0.0	2.0	Green Bay.....	14.0	11.2	1.2
<i>Washington.</i>				Hayward.....	2.5	30.0	25.0
Aberdeen.....	18.0	2.0	0.0	Hillsboro.....	14.0	10.0	T.
Chehalis.....	21.0	.....	.....	Koepenick.....	5.0	25.0	22.0
Crystal Springs.....	11.0	0.0	0.0	Medford.....	13.0	19.0	16.0
Davenport.....	.....	11.0	9.0	Menomonee.....	3.2	13.0	10.0
East Clallam.....	10.0	.....	.....	Milwaukee.....	10.6	6.0	T.
Elbe.....	34.2	13.0	.....	Neillsville.....	4.0	15.0	12.0
Fort Canby.....	12.1	0.0	0.0	New Holstein.....	13.0	3.0	0.0
Fort Simcoe.....	11.0	.....	.....	Ouseola.....	2.0	18.0	12.0
Fort Townsend.....	12.2	0.0	0.0	Shawano.....	5.0	10.0	10.0
Hunters.....	14.8	23.0	19.0	Stevens Point.....	6.0	10.0	6.0
Lapush.....	18.0	1.0	0.0	Weston.....	4.2	12.5	6.0
Madrone.....	19.5	1.5	.....	<i>Wyoming.</i>			
Olympia.....	11.9	0.0	0.0	Fort Yellowstone.....	11.2	.....	.....
Pine Hill.....	17.8	0.0	0.0	Lander (V. O.).....	11.0	4.0	.....
Pomeroy.....	10.5	.....	.....		

HAIL.

Description of the more severe hailstorms of the month is given under "Local storms." Hail was reported as follows: 3d, Alabama. 7th, Oregon and Texas. 8th, Arkansas, California, Louisiana, Mississippi, and Oregon. 9th, Connecticut, Michigan, Ohio, and Oregon. 11th, Arkansas, Mississippi, and Texas. 15th, California, Connecticut, and Oregon. 16th, Arizona. 17th, Arkansas, California, Indian Territory, Missouri, and Oregon. 18th, California and Oregon. 19th, Alabama, Arkansas, Georgia, Louisiana, New Jersey, North Carolina, and Tennessee. 20th, Pennsylvania. 24th, Louisiana. 26th, Connecticut. 28th, Texas.

FOG.

The principal dates on which fog occurred are as follows: *Alabama.*—1st, 18th, and 19th. *Arizona.*—Fort Bowie, 2d and 5th; a very unusual phenomenon in this Territory.

Illinois.—7th, 8th, 9th, 25th, 27th, and 28th.

New England.—Portland, Me., 13th, intense cold fog over

the harbor of Portland and along the coast to Seguin in the early morning; the vapor froze to everything touched by it. *Louisiana.*—1st, 2d, 3d, 16th, 18th, 19th, 21st, and 22d.

Mississippi.—1st, 2d, 18th, and 26th.

Missouri.—7th.

Nevada.—Heavy "Pogonip" at Magill on the 13th. [See "Notes by the Editor."]

New Jersey.—3d, 9th, 10th, 19th, and 21st.

Oklahoma.—Pond Creek, 6th, fog, followed by high north wind.

Tennessee.—3d, 6th, 7th, 8th, 16th, 18th, 19th, 26th, and 27th.

Utah.—At Provo very heavy fog on the night of the 28th.

SLEET.

Description of the more severe sleetstorms of the month is given under "Local storms." Sleet was reported as follows: 1st, Indiana, Nevada, New Jersey, and Ohio. 2d, Arizona, Illinois, Kentucky, Maryland, Missouri, and North Carolina. 3d, Arkansas, Kansas, Kentucky, Missouri, and Pennsylvania. 4th, Arkansas, Maryland, New Jersey, New York, Pennsylvania, and Virginia. 5th, New York. 6th, Arizona and California. 7th, Arizona, California, Nevada, New York, Ohio, Oregon, Pennsylvania, Texas, and Washington. 8th, California, Kansas, Maine, Massachusetts, Minnesota, Nevada, North Dakota, Ohio, Oregon, and Wisconsin. 9th, California, Connecticut, Indiana, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, Ohio, Oregon, Pennsylvania, and Wisconsin. 10th, Arizona, Arkansas, California, Indiana, Massachusetts, Michigan, Missouri, New Hampshire, New York, and Ohio. 11th, Arizona, Arkansas, Indian Territory, Kansas, Kentucky, Maryland, Missouri, North Carolina, Oklahoma, Texas, and Virginia.

12th, Arizona, Arkansas, Connecticut, Delaware, District of Columbia, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Missouri, Nevada, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Texas, Vermont, Virginia, and West Virginia. 13th, Mississippi, New Jersey, North Carolina, Ohio, Pennsylvania, and Texas. 14th, Indian Territory, Louisiana, Maryland, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, Texas, Virginia, and West Virginia. 15th, Alabama, Arizona, California, Connecticut, Georgia, Maine, Maryland, Massachusetts, Mississippi, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Virginia, and Washington. 16th, California, Ohio, Oregon, South Dakota, and Virginia. 17th, California, Indiana, Michigan, Minnesota, Mississippi, Missouri, Ohio, South Dakota, and Washington. 18th, Maryland, New York, and Oregon. 19th, Maryland, Nevada, New Jersey, Oregon, Pennsylvania, and Tennessee.

20th, Nevada and Utah. 21st, Arkansas, Delaware, Indian Territory, Maryland, Mississippi, North Carolina, Tennessee, Texas, and Virginia. 22d, Alabama, Arkansas, Louisiana, Mississippi, Tennessee, Texas, and Virginia. 23d, Alabama, Arkansas, Georgia, Louisiana, Mississippi, South Carolina, and Texas. 24th, Alabama, Arkansas, Louisiana, Mississippi, North Carolina, Oregon, South Carolina, Tennessee, and Texas. 25th, Alabama, Delaware, District of Columbia, Georgia, Louisiana, Maryland, Mississippi, New Jersey, North Carolina, Pennsylvania, South Carolina, Tennessee, Virginia, Washington, and West Virginia. 26th, District of Columbia, Georgia, Maryland, Massachusetts, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Virginia, and West Virginia. 27th, Georgia and Ohio. 28th, Utah.

WET AND DRY PERIODS IN RELATION TO AGRICULTURE.

The Weather Crop Bulletin for the month of February shows that precipitation was in excess over a large portion of the United States, and that at the close of the month, not-

withstanding the heavy snowfall, there was practically no snow on the ground over the greater portion of the winter-wheat region. The following notes have been extracted from the monthly reports of the State Weather Services, and refer to the relation between precipitation and agriculture:

Alabama.—The weather for the month was generally unsettled; rainy periods were quite close together; on the 24th, hail and sleet; 25th, rain, sleet, hail, and snow; these conditions retarded plowing preparatory to early planting.

Arizona.—The amount of snow ranged from 24 inches at Flagstaff to a trace at Peoria; the total was unusually great, and has not been equaled in many years.

Iowa.—The precipitation on the 11th and 12th south of the Ohio and Missouri valleys was rain, and north of this snow, all of which will prove beneficial rather than injurious to agricultural interests.

Louisiana.—Precipitation was rather below the average in the northern half of the State, but with more than the usual number of rainy days, and farmers are considerably behind with their work. Abbeville: on the 20th to 22d rain came in floods; every bridge was washed away; the water was higher than for sixteen years; the month was very unfavorable for farm work.

Mississippi.—A general storm of snow and sleet on the 24th and 25th, and snow fell in all portions of the State; trees were covered with ice for two or three days in the northern and central districts; ice on the trees did considerable damage in breaking off limbs.

New England.—In northern New Hampshire an observer reports that wells and springs were never before known to be so low at this time of the year.

Ohio.—Between the 12th and 27th heavy snow fell over the State, affording good protection to the cereals in the ground. At the close of the month the wheat was generally in fair condition. The snowfall of the 12th and 13th was especially heavy over the middle and northern sections; that of the 25th was heaviest over the southern and southern portions of the middle sections. During the progress of these two storms all commercial business nearly ceased.

South Carolina.—Precipitation was well distributed over the entire State, with an average of ten rainy days; the principal precipitation occurred as rain on the 14th and 15th, and as rain, sleet, or snow on the 24th to 26th; the ground was not frozen when the snow and sleet began, nor did it freeze, and so was in the best possible condition to receive the utmost benefit from the gradual thawing and the subsequent absorption of the greater part of the snow and sleet.

Utah.—The deficiency of rainfall in the northern part of the State was not enough to spoil the prospect of an abundant water supply for the coming summer.

Wisconsin.—In the lumber districts of the north, on the 28th, the snow lay from 10 to 30 inches deep in the woods. At the close of the month the southern half of the State, containing nearly all the area of winter grains, was entirely bare of snow and the frost rapidly coming from the ground; conditions very unfavorable for crops, as considerable freezing weather must ensue before spring can permanently open.

WIND.

PREVAILING WINDS.

The prevailing winds for February, 1894, viz., those that were recorded most frequently at Weather Bureau stations, are shown in Table I, but are not given on Chart II, as has hitherto been the custom. The summary of State Weather Service reports gives the prevailing winds as recorded at voluntary stations in the respective States; these may be summarized as follows:

North.—Alabama, Arkansas, Kansas, Louisiana, Mississippi, Oklahoma, Tennessee, Texas, and Virginia.

Northeast.—None.

East.—None.

Southeast.—None.

South.—Washington.

Southwest.—Illinois, Michigan, Nevada, North Carolina, Ohio, South Carolina, and Wisconsin.

West.—California, Colorado, Idaho, West Virginia, and Wyoming.

Northwest.—Illinois, Indiana, Iowa, Kentucky, Maryland, Minnesota, Missouri, Nebraska, New England, New Jersey, New York, North Dakota, Pennsylvania, South Dakota, and Utah.

RESULTANT WINDS.

The resultants for the current month, as deduced from the hourly records of winds, by self-registers at 67 regular Weather Bureau stations, are given in Table VIII. Other resultants deduced from the personal observations made at 8 a. m. and 8 p. m. at all stations that appear on the morning and evening maps of the Weather Bureau are given in Table IX. These latter resultants are also shown graphically on Chart II, in connection with the isobars based on the same system of simultaneous observation; the small figure attached to each arrow shows the number of hours that this resultant prevailed, assuming each of the morning and evening observations to represent one hour's duration of a wind of average velocity; these figures (or the ratio between them and the total number of observations in this month) will indicate the extent to which winds from different directions counterbalanced each other. The actual north, south, east, and west components, on which these resultants are based, are given in detail in Table IX for convenience in making further studies.

During February the movement from the northwest has prevailed along the Atlantic coast, except southwest in Florida

and southern Georgia. The movement from the southwest has prevailed in the Lake region, and the movement from the southeast has prevailed over the northern plateau and north Pacific coast.

HIGH WINDS.

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows. Maximum velocities are averages for 5 minutes; extreme velocities are gusts of shorter duration:

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles.				Miles.	
Amarillo, Tex.	8	60	w.	Fort Canby, Wash.	26	54	s.
Do	11	52	n.	Do	27	58	s.
Do	17	56	nw.	Keeler, Cal.	21	52	nw.
Block Island, R. I.	12	72	e.	Lexington, Ky.	12	50	ne.
Do	13	73	e.	Nantucket, Mass.	13	58	se.
Do	26	68	e.	Pikes Peak, Colo.	16	92	w.
Do	27	56	ne.	Do	17	91	nw.
Buffalo, N. Y.	10	58	w.	Saint Louis, Mo.	9	58	sw.
Cheyenne, Wyo.	17	50	nw.	Tatoosh Island, Wash. ...	4	50	sw.
Chicago, Ill.	16	50	sw.	Do	7	52	sw.
Do	12	64	ne.	Do	14	52	s.
Do	16	50	sw.	Do	18	50	e.
Do	17	51	s.	Do	19	72	e.
Colorado Springs, Colo. ...	8	55	nw.	Do	12	60	ne.
Do	16	59	w.	Toledo, Ohio	10	60	sw.
Do	20	54	w.	Tucson, Ariz.	10	60	sw.
Detroit, Mich.	10	57	sw.	Winnemucca, Nev.	11	55	s.
Eastport, Me.	15	50	se.	Do	17	58	sw.
Fort Canby, Wash.	4	60	se.	Do	18	72	sw.
Do	6	60	se.	Do	19	74	sw.
Do	7	58	se.	Woods Holl, Mass.	16	50	nw.
Do	11	52	e.	Do	23	58	nw.
Do	14	80	s.	Yuma, Ariz.	10	52	nw.

LOCAL STORMS.

3d.—Destructive local storms occurred in Georgia, Alabama, and Mississippi. At Atlanta, Ga., a gale of short duration began at 10.10 a. m., and reached a maximum velocity of 48 miles per hour at 10.35 a. m., accompanied by a heavy shower of rain for ten minutes; damage was done to fences and electric wires. In Alabama the windstorm was the most severe that has occurred in a number of years. At Irondale, Ala., showers, with gusts of wind, occurred from 6 to 7 p. m. At East Birmingham, about 4 miles west of Irondale, the storm moved due east, with a zigzag motion, in a path about 2 miles wide; a church was blown down and other damage done. At Gate City, a suburb of Birmingham, the railroad station and a church were blown down and sev-

eral smaller buildings demolished; there were 30 persons in the church at the time, 4 of whom were killed and the remainder more or less injured. A violent storm of short duration, and moving southeast, struck Columbus, Miss., at 5.30 p. m.; a funnel-shaped cloud was observed; several persons were injured and the damage to property was estimated at \$2,500. At Winona, Miss., the railroad depot was moved from its foundation and a large storehouse destroyed. A severe storm moving south, in a path several miles wide, passed over Artesia, Miss., at 5.15 p. m.; 5 funnel-shaped clouds were observed; great destruction was done to property. About 4 p. m., a storm moving east, with heavy rain after, caused \$3,000 damage at McCarley, Miss.

4th.—A northwest gale occurred at Pensacola, Fla., in the afternoon. At Santa Rosa Sound, 10 miles from Pensacola, a sail boat was capsized, and 5 men were drowned.

7th.—Four miles southeast of Palestine, Tex., a windstorm blew down outhouses and fences. At Rockdale, Tex., a storm, with heavy rain, moved southeast at 11.10 p. m.; a church was damaged to the extent of \$1,600. A heavy thunder and rain storm occurred at Kountze, Tex., about midnight; a few miles north and south some small buildings were unroofed.

8th.—Severe gales and heavy rain passed over southern Louisiana in the morning. The storm was exceptionally severe in the vicinity of Port Hudson, in East Baton Rouge Parish, where it occurred between 7 and 8 a. m. Buildings were moved from their foundations and large trees uprooted. On plantations 2 miles north of Port Hudson a number of persons were injured and a child was killed; stock was also killed and the damage to property considerable. At New Orleans, La., a gale, beginning in the morning, attained a maximum velocity of 42 miles per hour from the south at 12.25 p. m. A building in course of erection was blown down and other damage done. At Greenville, Miss., a wind and rain storm, moving southeast, began at 10.30 a. m.; one person was killed and damage done to property. At Huntington, Miss., a storm moving northeast, with heavy rain and light hail before, occurred about 11 a. m.; minor damage was done. On the 8th, at 10 a. m., special warnings were sent from Washington to Tennessee, Illinois, Arkansas, and Missouri, i. e., "conditions are favorable for severe local storms this afternoon or evening."

9th.—Severe local storms occurred in Arkansas, the Ohio Valley, Tennessee, and the Lake region. At Hicksville, Ohio, a heavy thunderstorm moved northeast, with heavy rain followed by hail; damage to buildings, \$500. At Toledo, Ohio, the storm was of short duration, attended by thunder and lightning and high wind; hail fell for two minutes. The wind reached a maximum velocity of 47 miles per hour from the northwest and an extreme velocity of 55 miles. A house was struck by lightning and a woman and child were injured; a house in course of erection was blown down and other damage done. At Fremont, Ohio, small buildings were overturned. High wind did considerable damage throughout Indiana. At Michigan City, Ind., the storm occurred between 3 and 4 p. m.; light thunder was heard; 5 freight cars were demolished and other damage done. At Madison, Ind., considerable damage of a minor character was sustained. At Huntingburg, Ind., a severe gale unroofed barns and blew down trees. At Peru, Ind., a storm moving southeast caused damage to the amount of \$1,000. High wind caused minor damage at Decatur, Ill. The southern part of Michigan was swept by a heavy storm in the afternoon. At Dundee, Mich., the storm was attended by thunder, lightning, and heavy hail; it moved from the southwest with great speed, doing considerable damage. At Royal Oak, Mich., 2 persons were slightly injured, and damage was caused of a minor character. An unusually heavy gale struck St. Louis, Mo., at 10.30 a. m., the wind reaching a

maximum velocity of 58 miles per hour. Considerable damage was done to property and a number of persons were injured by flying debris. On the 9th, at 10 a. m., special warnings were sent from Washington to Iowa, Missouri, Illinois, Indiana, Wisconsin, Ohio, Kentucky, Michigan, and West Virginia, i. e., "conditions are favorable for the occurrence of severe local storms this afternoon or evening."

10th.—At Toledo, Ohio, high winds in the early morning reached a maximum velocity of 37 miles per hour, and an extreme velocity of 60 miles. A boy was injured. During a windstorm at Mount Huachuca, Ariz., outhouses were unroofed. A gale from the northwest prevailed at Fresno, Cal.; the Pine Ridge flume was blown down.

11th.—High wind blew down fences at Adairsville, Ga. A thunderstorm, with high wind and heavy rain, occurred at Vicksburg, Miss., about 9.20 p. m.; damage was done by flood. A heavy thunder and rain storm moved northwest over Beauregard, Miss., at 11 p. m.; 5 persons were injured and buildings were damaged to the extent of \$3,000. Unusually high winds, accompanied by sleet and snow, and in some localities the coldest weather of the winter, prevailed over Texas, Kansas, Oklahoma, and Indian Territory, delaying traffic and causing much suffering to cattle. Special warnings of a severe norther were telegraphed from the Weather Bureau at Washington on the morning of this date to railroads and Weather Bureau observers in Texas. At San Antonio, Tex., a gale began in the afternoon and reached a maximum velocity of 45 miles per hour; considerable damage of a minor character was done. At Shiner, Tex., a storm moved east in a narrow path at 3.30 p. m.; it had a whirling motion and a funnel-shaped cloud was observed. A church was damaged and houses were moved from their foundations. A heavy drifting snowstorm set in over Topeka, Kans., at 8.30 a. m., delaying railroad and street-car traffic. At Dodge City, Kans., the most severe norther, accompanied by the heaviest snow that has visited that section in years, began in the early morning. No trains on the Santa Fe railroad arrived until 6 p. m. of the 12th; cattle were lost and stock on the plains suffered badly.

12th.—High winds and heavy snowstorms extended from New England to the Mississippi Valley, delaying traffic and causing damage to property, and several local storms occurred in Alabama and North Carolina. Wrecks occurred along the New England and New Jersey coasts, and in some cases were attended by loss of life. At Buffalo, N. Y., the storm was the most severe in the history of that station. It began on the 12th, at 7.35 a. m., and continued until the morning of the 13th. The snow, which was light and feathery, was drifted by the high wind in some sections to a depth of 4 to 5 feet. About 6 p. m., a tornado appeared about 4 miles north of Chapel Hill, in Orange County, N. C. It traveled in a northeast path about 100 yards wide; a funnel-shaped cloud was observed, which alternately raised and lowered. Large trees and everything in its path were gathered up and whirled around like pieces of paper. The tornado passed about 15 miles northeast to Durham, and disappeared near Cozart, in Granville County. No lives were lost, but great damage was done to property.

On the 11th, at 11 p. m., special warnings, i. e., "conditions favorable for severe local storms," to occur on the 12th, were sent to the Weather Bureau observers in Alabama. At Dunham, Ala., several houses were blown down, trees uprooted, and fences blown away; several persons were injured. At Snow Hill, Ala., the path of the storm was about half a mile wide; a church and school-houses and many cabins were demolished. At Camden, Ala., several houses were unroofed, trees uprooted, and a barn blown down. Damage was also done at Troy and Eufaula, Ala. At Pleasant Hill, Ky., a heavy rain and wind storm damaged property to the extent of \$1,500. At Toledo,

Ohio, snow began at 7.05 a. m., with a gale reaching a maximum velocity of 60 miles per hour from the northeast, and an extreme of 88 miles; the storm was the heaviest ever experienced; the Weather Bureau observer at that place reports that snowdrifts in some places reached 8 feet high; considerable damage was done by high wind, and traffic was suspended; the gale caused the water in the river to rise rapidly, flooding docks and cellars. The heaviest storm in the history of Chicago began in the early morning; snow began at 5.30 a. m., and continued during the day; the wind averaged nearly 70 miles an hour from the northeast for more than ten hours and reached a maximum velocity of 84 miles at 11 a. m.; damage was done to the amount of \$250,000. At Detroit, Mich., snow began at 9.20 a. m., and continued during the day, accompanied by high wind; trains were delayed throughout the State, and business in general suffered. At Port Huron, Mich., snow began at 9.51 a. m., with high winds, reaching a maximum velocity of 48 miles per hour; the wind did not go below 40 miles an hour during the afternoon, drifting the snow in some places to a depth of 6 feet. At Milwaukee, Wis., snow began during the early morning, accompanied by a gale of 42 miles per hour, drifting the snow badly. The storm was general throughout Iowa, Kansas, and Missouri, and traffic was greatly delayed.

15th.—At Key West, Fla., high winds attained a maximum velocity of 42 miles per hour; 23 miles west of Key West a bark went ashore. A thunderstorm, with high wind

and heavy rain, moved northeast over Alexandria, La., about 1 a. m., damaging property to the extent of \$10,000.

17th.—During a thunderstorm on the Arkansas River, near Little Rock, Ark., a man was killed by lightning.

19th.—A thunderstorm at Hightstown, N. J., caused minor damage. Damage was caused by heavy rain and high wind in California, north of San Francisco. Damage was done by a windstorm which began in Nevada on the 17th and continued during the 19th.

22d.—A report from Los Angeles, Cal., states that a severe norther prevailed in that section. Great damage was done to oranges and other fruits.

24-26th.—Unusually severe snow and sleet storms prevailed from Massachusetts over the south Atlantic States, and extended over the Ohio Valley and Tennessee to Texas, attended by heavy gales from the New England to the North Carolina coasts.

Special warnings of heavy snow were sent out to the observers of the Weather Bureau at Washington, Baltimore, Philadelphia, New York, Pittsburg, and Buffalo, and to railroads in Maryland, District of Columbia, and Pennsylvania. A tabulated statement giving the beginning and ending and the total depth of snow in the Southern States during this storm is given on pp. 61-62. At Charleston, S. C., and other points in the South early vegetables were considerably injured.

28th.—During a thunderstorm at Rush Point, La., a man was killed by lightning.

ATMOSPHERIC ELECTRICITY.

THUNDERSTORMS AND AURORAS.

The table on page 69 shows in detail for February, 1894, the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month.

THUNDERSTORMS.

A mention of the more severe thunderstorms reported during the month is given under "Local storms." The dates on which reports of thunderstorms were most numerous are the 9th, 11th, and 19th. The dates on which reports were least numerous are the 4th, 5th, 6th, 13th, 14th, 15th, 16th, 22d, 23d, 24th. The States from which the most numerous reports were received were: Arkansas, 46; Florida, 40; Louisiana, 73; New Jersey, 28; Texas, 32.

AURORAS.

The evenings on which bright moonlight must have interfered with observations of faint auroras were the 15th to 23d, inclusive. On the remaining twenty days of the month 232 reports were received, or an average of 11 per day. The dates on which the reported number especially exceeded this average were the 21st, 22d, 23d, 24th, 25th, and 28th. The period of maximum thunderstorm frequency, viz, the 17th to 21st preceded the great auroral display by several days, but there may have been no very close connection.

The aurora of the 22d and 23d was one of the most remarkable of recent years; reports of its visibility have been received from over 600 stations representing every State, except Indian Territory, Texas, Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, and South Carolina, and this mass of data is worthy of a more thorough analysis than can be given to it in the present REVIEW. The 19th, 20th, and 21st had been marked by an unusual number of thunderstorms in Louisiana and New Jersey and the weather maps of those days show that the low pressures and rain or snow areas in the

Southwest, Gulf, and Atlantic States were finally pushed south and east by the great high area, No. VII, which apparently moved from Siberia into Alaska and southeastward until, on the 22d, 8 p. m., it was central in Wyoming, but on the 23d, 8 p. m., extended as a ridge over Idaho, Wyoming, Minnesota, and Ontario. There was a similar area of high pressure January 12-14, 1893, in Siberia and North America, but I do not know that a special auroral display attended it.

The reports of the aurora of February 22 and 23 show many interesting chronological and geographical correlations, among which I note the following:

1. The reported time of beginning of visibility of the aurora, as expressed in uniform seventy-fifth meridian time, or, if it is preferred, uniform Greenwich time, or any other preferred uniform system, seems to have been earlier on the 23d than on the 22d (16 regular Weather Bureau stations report earlier, 5 later, and 4 the same time). This would be an important point were it not that one must naturally fear lest the occurrence of the aurora on the 22d had made the observers more alert on the 23d.

2. As expressed in seventy-fifth meridian time the aurora began on the 22d between 8 and 9 p. m. in New England, Lake Superior, Minnesota, and North Dakota; between 9 and 10 p. m. in the States south and west of this region, and between 10 and 10.30 p. m. in the extreme southern border and in California, Washington, and Oregon. This correlation with absolute time might be supposed to furnish some suggestions as to the position of the earth in its orbit and of the relation of the aurora to the sun, but the records show that, expressed in the same absolute time, the visibility on the 23d began between 6 and 8 p. m. in New England and New Jersey; between 8 and 9 p. m. in the upper Lake region and Minnesota; between 9 and 10 p. m. at stations south and west of these. The records of the two nights do not seem to show any uniform relation, indicating that the aurora depended upon emanations from the sun; it would certainly be incredible that these, if they occurred, should have hap-

Thunderstorms and auroras, February, 1894.

States.	No. of stations.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	Total.		
Alabama.....	50	T.	2	3	2				3			5	4	1	1					3	1												26	T.	
Arizona.....	56	T.													1																			0	A.
Arkansas.....	44	T.		3	4			8	4			9	2				1	10		1			2							4			46	T.	
Colorado.....	81	T.			1	2	2					1								1		1											34	A.	
California.....	324	T.										1										2	9	15	2								31	A.	
Connecticut.....	24	T.													1					1	1			26	1		1						29	T.	
Delaware.....	5	T.																					1	11									15	A.	
District of Columbia.....	4	T.																					1	2			1						3	T.	
Florida.....	37	T.								3	2	2	11	1	2				1	5		2		1			5				5		40	T.	
Georgia.....	37	T.			1				3			1	4		1				2	2		1					2						17	T.	
Idaho.....	24	T.																																0	A.
Illinois.....	57	T.							1										1				2	6	1								9	T.	
Indiana.....	45	T.						1		1												1	18	19	2	1							41	T.	
Indian Territory.....	8	T.								2		1											13	13	1								29	T.	
Iowa.....	77	T.																																0	T.
Kansas.....	68	T.			1		1		1	1										2		1	40	42	3	1							90	T.	
Kentucky.....	38	T.																					16	7									23	A.	
Louisiana.....	52	T.	6	1	1		1		8		2	10	3			2		2		7	8	10	4	6	2								12	A.	
Maine.....	22	T.																																0	T.
Maryland.....	26	T.		3	1				1													1	7	11			1			2			27	A.	
Massachusetts.....	85	T.																					3	7									10	A.	
Michigan.....	73	T.																				1	13	44	3								67	A.	
Minnesota.....	72	T.								25													4	13	21	6	1	1					51	T.	
Mississippi.....	41	T.	3	3	1	1		8		1									2		1	2	50	49	10	3		3	9				147	A.	
Missouri.....	89	T.	7	1				1	1			8	4	1					1		2	1			1	1							29	T.	
Montana.....	20	T.								6		3							3	4													20	A.	
Nebraska.....	70	T.																					2	19	23	2	3						54	A.	
Nevada.....	35	T.																																0	T.
New Hampshire.....	29	T.																																59	A.
New Jersey.....	58	T.		3			1	1	1		5																							35	T.
New Mexico.....	26	T.																																43	A.
New York.....	81	T.																																1	T.
North Carolina.....	56	T.																																7	A.
North Dakota.....	35	T.																																42	A.
Ohio.....	134	T.																																4	T.
Oklahoma.....	16	T.																																4	A.
Oregon.....	69	T.																																0	T.
Pennsylvania.....	86	T.																																1	A.
Rhode Island.....	9	T.																																29	T.
South Carolina.....	42	T.																																13	A.
South Dakota.....	43	T.																																0	T.
Tennessee.....	41	T.																																52	A.
Texas.....	66	T.																																19	T.
Utah.....	35	T.																																2	A.
Vermont.....	14	T.																																0	T.
Virginia.....	39	T.																																9	A.
Washington.....	49	T.																																2	T.
West Virginia.....	25	T.																																18	A.
Wisconsin.....	65	T.																																5	T.
Wyoming.....	14	T.																																	

pened day after day at intervals so nearly equal to twenty-four hours in this as in many other auroras.

3. On the other hand it is remarkable that the whole auroral display began on the 22d on the Pacific coast, where it was seen by a large proportion of the observers in Washington, Oregon, and northern California, whereas it was seen on that evening by only a small portion of the observers in the Eastern States. On the 23d it was not seen on the Pacific coast, partly owing to cloudiness, and at only a small portion of the Rocky Mountain stations, whereas it was seen in a large portion of the Middle and Eastern States. On both nights the proportion of stations in the Dakotas, Minnesota, and adjacent States was about the same. The conclusion suggested by these facts, viz, that the conditions favorable to the aurora were moving eastward across the continent, is confirmed by the following paragraphs.

4. By charting the absolute times of beginning and by drawing lines showing the times of sunset over the country we obtain the interval between sunset and the first appearance of the aurora, and notwithstanding the irregularities in the records, it becomes apparent that on the 22d the aurora began to be visible 1 hr. and 40 min. after sunset in California, 1 hr. and 30 min. in Oregon, and 1 hr. and 20 min. in Washington. Over Idaho, Montana, North Dakota, northern Minnesota, Wisconsin, and Lake Superior the interval after sunset was, for the earliest reports, from one to two hours, averaging about the same as northern California. Further south and east of this belt there was a region about 500 miles broad in which the aurora, or rather individual local auroras, first began to appear between two and three hours after sunset. Finally, at most stations in Kentucky, Ohio, New York, and New England, if visible at all, auroras occurred from three to four hours after sunset; there is every appearance of a promulgation eastward of the conditions favorable to the aurora, the rate being most rapid on the Pacific coast and least rapid in the interior.

5. The movement is like that of the front of a school of fish where each fish is pushing ahead of his fellows and is well brought out if, instead of comparing stations that lie east and west of each other, we collate those that lie north and south, from which it appears that the aurora always began later after sunset at southern stations than at northern ones, and that, in fact, in the extreme north it was doubtless in progress at and before sunset; this points unmistakably to the conclusion that either the cooling by radiation, which we call nocturnal cooling, or the general south and east movement of masses of cold air, or both, brought the atmosphere into those conditions as to temperature and humidity that were necessary for the auroral display. On the 21st and 24th a few auroras were reported from both the central auroral area and the outlying States, showing that favorable conditions are always present here and there, and that the general aurora is due to a special combination of these.

6. The relative importance of the movement of cold air and of the nocturnal radiation is shown by comparing the chart of auroral display with the daily weather chart, from which it will be seen that for a week before the aurora the great area of high pressure, No. VII, with its attendant cold, dry air and clear sky, had been pressing southeastward from Alberta into the Missouri Valley and the Lake region. Auroras were reported on the 21st at a few stations in the Lake region and in North Dakota, Idaho, Nevada, and Oregon. This layer of cold air near the surface of the earth must, according to all experience, have been accompanied in its latter stages by comparatively warm air above it, and in the nearly horizontal plane between these two layers was one whose moisture and temperature required only a slight cooling, due to nocturnal radiation, in order to bring it into the condition in which the aurora was possible. As the isotherm of 20° on the p. m. map

includes nearly the whole area of visibility we note that the movement of the front of the area of high pressure from February 20, 8 p. m., to February 21, 8 p. m., had not carried the isotherm of 20° appreciably south or east or west; it had barely held its own for three days, but from the 21st to the 22d this isotherm had moved northward across the line from New Mexico to New England and slightly eastward across the line from New Mexico to British Columbia; therefore, a great layer of cold air was here hemmed in by the Rocky Mountains and the Appalachian range, filling the lowlands, moving southward, pushing some surface air northward but in other regions rising and flowing back overhead on itself, and steadily accumulating a layer of warmer, moister air above it.

The progress south and east of the high area had prepared the way at a comparative slow rate of advance, but the process of cooling by radiation is one that goes on simultaneously and attains the proper degree almost simultaneously, over large regions, and this, alone, explains the rapid spread of the aurora further south and east during the evenings of the 22d and 23d, when once the way had been prepared. The southward increase of the interval between sunset and visibility was, on the 22d and on the Pacific coast, at the rate of about one minute of time to each degree of latitude, but in the dry interior between the ninetieth and one hundredth meridians and the thirty-ninth and forty-ninth parallels it was at the rate of about fifteen minutes of time to the degree.

If the angular rate at which an observer perceives his own auroral light to advance southward be compared with the general linear rate of progress of the whole display from station to station there will result a determination of the altitude of the auroral stratum above the earth. Thus, fifteen minutes of time for 1° of latitude for the general advance, and fifteen minutes of time for an apparent advance at any station from 45° altitude in the north to the observer's zenith, would correspond to an altitude of 70 miles. If this calculation be applied to the "merry dancers" that move in a second, or less, from the horizon up to the zenith, it gives an altitude of 1 mile.

7. In so far as distinctly well-marked beams and arches were recorded on the 22d and 23d they show no such agreement as to time and location as to justify any effort to determine the exact distance of the aurora from the stations, but they confirm the conclusion long since announced that such parallax methods are impracticable and illusory.

Many observers describe waves or beams, streamers or clouds of light as moving from east to west or from west to east. If this motion were due to general causes, it would be an important item of knowledge. On collating the reports it would seem that none have recorded the phenomena with sufficient fullness and accuracy to warrant minute analysis. Six observers report that streamers moved at first from east to west and subsequently from west to east; two speak of them as moving east and west; seven speak of them as moving from east to west and say nothing about the contrary movement; three speak only of the motion from west to east.

8. On both the western and southern sides of the aurora of the 22d and 23d the temperature of the air at the surface became warmer on the following day, but on the eastern side the temperature fell with the advance of the region of high pressure. As this region of fall was limited by the absence of reports and not by a meteorological boundary it does not argue against the general principle that the most extreme limit east as well as west at which an aurora appears is one over which the temperature will probably rise the next day in proportion as the cold and dryness of the high area is being overcome by the warmth and moisture of the regions into which it is advancing.

9. The U. S. Naval Observatory at Washington reports

that a magnetic storm began on the 20th and continued for a week thereafter, the details of which will be published elsewhere. Apparently, therefore, the electric disturbance that caused the magnetic storm had accompanied this area of high pressure from its very beginning in Siberia or Alaska.

10. As a suggestion in future observations of the aurora and in order to save time it is recommended that when an aurora appears in the early evening each observer should first determine the exact error of his watch on standard seventy-fifth meridian time, and then, in addition to any general description of the aurora that he may choose to make, should make an exact description of the location of the beams,

streamers, and arches and the colored lights at the exact minute of the beginning of the whole hours 7, 8, 9, 10, or 11 p. m. of this standard time and should note whether at such moments the beams are moving eastward or westward.

EARTH CURRENTS AND MAGNETIC STORMS.

The U. S. Naval Observatory at Washington reported a remarkable magnetic storm from the 20th to the 26th.

Disturbances on the telegraph lines were reported on the following dates, viz, at Davenport, Iowa, February 22, for one hour on lines in all directions; Kansas City, Mo., on the 23d; Duluth, Minn., 22d, 23d, 24th, 28th.

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for February, 1894, of the directors of the various state weather services:

ALABAMA.

Temperature.—The mean was 1.4 below the normal; maximum, 80, at Brewton, 21st, and at Geneva, 9th and 18th; minimum, 12, at Opelika, 13th; greatest monthly range, 59, at Newburg and Opelika; least monthly range, 41, at Birmingham.

Precipitation.—The average was 2.42 above the normal; greatest monthly, 16.54, at Brewton; least monthly, 1.71, at Sturdevant.

Wind.—Prevailing direction, north.—*F. P. Chaffee, Local Forecast Official, Weather Bureau, Montgomery, director.*

ARIZONA.

Temperature.—The mean was 5.0 below the normal; maximum, 89, at Buckeye, 28th; minimum, -9, at Flagstaff, 14th; greatest monthly range, 71, at Whipple Barracks; least monthly range, 43, at Oracle and Red Rock.

Precipitation.—The average was 0.10 below the normal; greatest monthly, 3.43, at Fort Grant; least monthly, trace, at Parker and Yuma.—*W. Burrows, Observer, Weather Bureau, Tucson, director.*

ARKANSAS.

Temperature.—The mean was 6.3 below the normal; maximum, 75, at Blanchard Springs and Hamburg, 19th; minimum, zero, at Rogers, 15th; greatest monthly range, 64, at Rogers; least monthly range, 41, at Mount Ida.

Precipitation.—The average was 1.98 above the normal; greatest monthly, 11.46, at Searcy; least monthly, 2.15, at Gaines Landing.

Wind.—Prevailing direction, north.—*F. H. Clarke, Local Forecast Official, Weather Bureau, Little Rock, director; G. G. Harkness, Observer, Weather Bureau, assistant.*

CALIFORNIA.

Temperature.—The mean was 3.0 below the normal; maximum, 90, at Indio and Volcano Springs, 27th; minimum, -15, at Truckee, 11th; greatest monthly range, 72, at Weaverville; least monthly range, 24, at San Francisco and Point Reyes Light.

Precipitation.—The average was 0.09 below the normal; greatest monthly, 16.48, at Meadow Valley; least monthly, 0.12, at Needles.

Wind.—Prevailing direction, west.—*J. A. Barwick, Observer, Weather Bureau, Sacramento, director.*

COLORADO.

Temperature.—The mean was 8.0 below the normal; maximum, 73, at Lamar, 23d; minimum, -34, at Steamboat Springs, 4th; greatest monthly range, 85, at Akron; least monthly range, 37, at Pikes Peak.

Precipitation.—The average was 0.10 above the normal; greatest monthly, 7.77, at Breckenridge; least monthly, trace, at Kirk.

Wind.—Prevailing direction, west.—*R. H. Sullivan, Observer, Weather Bureau, Denver, acting director.*

CONNECTICUT.

(See New England.)

DELAWARE.

(See Maryland.)

FLORIDA.

Temperature.—The mean was 2.1 below the normal; maximum, 86, at Orlando, 3d, at Orange City, 14th, and at Plant City, 10th and 19th; minimum, 28, at Mosely Hall, 6th, and at Tallahassee, 16th; greatest monthly range, 53, at Archer and Orange City; least monthly range, 27, at Key West.

Precipitation.—The average was 0.50 below the normal; greatest monthly, 11.19, at Tallahassee; least monthly, 0.02, at Key West.

Wind.—Prevailing direction, southwest.—*E. K. Demain, Observer, Weather Bureau, Jacksonville, director.*

IDAHO.

Temperature.—Maximum, 58, at Lewiston, 28th; minimum, -31, at Paris, 23d; greatest monthly range, 85, at Paris; least monthly range, 28, at Atlanta.

Precipitation.—Greatest monthly, 5.78, at Boise Barracks; least monthly, 0.39, at Chesterfield.

Wind.—Prevailing direction, west.—*J. H. Smith, Observer, Weather Bureau, Idaho Falls, director.*

ILLINOIS.

Temperature.—The mean was 3.1 below the normal; maximum, 65, at Palestine, 9th; minimum, -14, at Oswego, 21st; greatest monthly range, 63, at Philo; least monthly range, 43, at Saint Johns.

Precipitation.—The average was 0.89 below the normal; greatest monthly, 5.01, at Palestine; least monthly, 0.30, at Effingham.

Wind.—Prevailing direction, northwest.—*John Craig, Observer, Weather Bureau, Springfield, director.*

INDIANA.

Temperature.—The mean was 2.7 below the normal; maximum, 67, at Seymour, 9th; minimum, -10, at Valparaiso, 21st; greatest monthly range, 65, at Lafayette; least monthly range, 43, at Huntingburg.

Precipitation.—The average was 0.25 below the normal; greatest monthly, 6.50, at Marengo; least monthly, 1.46, at Logansport.

Wind.—Prevailing direction, northwest.—*Prof. H. A. Huston, Lafayette, director; C. F. R. Wappenhans, Local Forecast Official, Weather Bureau, assistant.*

IOWA WEATHER AND CROP SERVICE.

Temperature.—The mean was 3.0 below the normal; maximum, 60, at Glenwood, 7th; minimum, -19, at Atlantic, 21st; greatest monthly range, 72, at Atlantic; least monthly range, 44, at Mount Pleasant.

Precipitation.—The average was 0.50 below the normal; greatest monthly, 2.41, at Seymour; least monthly, trace, at Rock Rapids and Sibley.

Wind.—Prevailing direction, northwest.—*J. R. Sage, Des Moines, director; G. M. Chappel, Local Forecast Official, Weather Bureau, assistant.*

KANSAS.

Temperature.—The mean was 4.9 below the normal; maximum, 79, at Coldwater, 19th; minimum, -16, at Lakin, 12th; greatest monthly range, 78, at Manhattan; least monthly range, 57, at Rome.

Precipitation.—The average was 0.29 above the normal; greatest monthly, 2.82, at Lebo; least monthly, 0.10, at Eldorado.

Wind.—Prevailing direction, south.—*T. B. Jennings, Observer, Weather Bureau, Topeka, director.*

KENTUCKY.

Temperature.—The mean was 2.2 below the normal; maximum, 74, at Bowling Green, 9th; minimum, 2, at Elizabethtown, 5th; greatest monthly range, 64, at Eubanks and Harrodsburg; least monthly range, 46 at Catlettsburg.

Precipitation.—The average was 0.12 above the normal; greatest monthly, 7.99, at Russellville; least monthly, 2.98, at Pellville.

Wind.—Prevailing direction, northwest.—*Frank Burke, Local Forecast Official, Weather Bureau, Louisville, director.*

LOUISIANA.

Temperature.—The mean was 5.1 below the normal; maximum, 87, at Opelousas, 20th; minimum, 17, at Sugartown, 16th and 26th; greatest monthly range, 66, at Lake Charles; least monthly range, 40, at Port Eads.

Precipitation.—The average was 2.75 below the normal; greatest monthly, 13.83, at West End (New Orleans); least monthly, 2.92, at Minden and Delhi.

Wind.—Prevailing direction, north.—*R. E. Kerkam, Local Forecast Official, Weather Bureau, New Orleans, director.*

MAINE.

(See New England.)

MARYLAND.

Temperature.—The mean was 5.9 below the normal; maximum, 68, at Charlotte Hall, 18th, and at Millsboro, Del., 9th; minimum, —10, at Oakland, 17th; greatest monthly range, 62, at Oakland; least monthly range, 42, at Great Falls and New Market.

Precipitation.—The average was 0.03 below the normal; greatest monthly, 6.16, at Oakland; least monthly, 2.31, at Woodstock.

Wind.—Prevailing direction, northwest.—*Dr. William B. Clark, Johns Hopkins University, Baltimore, director; C. P. Cronk, Observer, Weather Bureau, in charge.*

MASSACHUSETTS.

(See New England.)

MICHIGAN.

Temperature.—The mean was 3.4 below the normal; maximum, 58, at Adrian, 9th; minimum, —31, at Grayling, 24th; greatest monthly range, 79, at Harbor Springs; least monthly range, 48, at Fairview.

Precipitation.—The average was 0.86 below the normal; greatest monthly, 5.11, Brown City; least monthly, 0.36, at Lewiston and Old Mission.

Wind.—Prevailing direction, southwest.—*E. A. Eeans, Local Forecast Official, Weather Bureau, Detroit, director.*

MINNESOTA.

Temperature.—The mean was 2.6 above the normal; maximum, 50, at Dawson, 26th, and at Rochester and Winona, 27th; minimum, —42, at Pokegama Falls, 5th; greatest monthly range, 78, at Marfield; least monthly range, 51, at St. Oloff.

Precipitation.—The average was 0.68 below the normal; greatest monthly, 1.02, at Caledonia; least monthly, 0.00, at Ortonville, Redwood Falls, and St. Cloud.

Wind.—Prevailing direction, northwest.—*E. A. Beals, Observer, Weather Bureau, Minneapolis, director.*

MISSISSIPPI.

Temperature.—The mean was 4.0 below the normal; maximum, 83, at Leakeville, 10th; minimum, 7, at Batesville, 26th; greatest monthly range, 60, at Batesville, Clarksdale, Port Gibson, and Vaiden; least monthly range, 42, at Biloxi and Greenville.

Precipitation.—The average was 0.50 above the normal; greatest monthly, 9.95, at Biloxi; least monthly, 3.18, at Greenville.

Wind.—Prevailing direction, north.—*R. J. Hyatt, Local Forecast Official, Weather Bureau, Vicksburg, director.*

MISSOURI.

Temperature.—The mean was 1.9 below the normal; maximum, 72, at Grovedale, 27th; minimum, —12, at Arthur, 15th; greatest monthly range, 74, at Stellada; least monthly range, 39, at Gorin.

Precipitation.—The average was 0.08 below the normal; greatest monthly, 6.63, at New Madrid; least monthly, 0.65, at Conception.

Wind.—Prevailing direction, northwest.—*A. E. Hackett, Observer, Weather Bureau, Columbia, director.*

NEBRASKA.

Temperature.—The mean was 3.8 below the normal; maximum, 65, at Bratton, 7th, and at Seward, 8th; minimum, —21, at Haigler, 12th; greatest monthly range, 81, at Haigler and Lexington; least monthly range, 52, at Mullen and Nebraska City.

Precipitation.—The average was 0.18 below the normal; greatest monthly, 2.23, at Plattsmouth; least monthly, trace, at Norfolk.

Wind.—Prevailing direction, northwest.—*George E. Hunt, Local Forecast Official, Weather Bureau, Omaha, director.*

NEVADA.

Temperature.—The mean was 6.0 below the normal; maximum, 71, at Downeyville, 27th; minimum, —41, at Stofiel, 4th; greatest monthly range, 91, at Sunnyside; least monthly range, 46, at Virginia City.

Precipitation.—The average was 0.59 above the normal; greatest monthly, 7.00, at Edgewood; least monthly, 0.12, at Belleville.

Wind.—Prevailing direction, southwest.—*Prof. Charles W. Friend, Carson City, director; F. A. Carpenter, Observer, Weather Bureau, assistant.*

NEW ENGLAND.

Temperature.—The mean was 2.5 below the normal; maximum, 59, at Stratford, 19th; minimum, —42, at West Milan, 25th; greatest monthly range, 91, at West Milan; least monthly range, 45, at Nantucket and Provincetown.

Precipitation.—The average was 0.27 below the normal; greatest monthly, 5.45, Wallingford; least monthly, 0.50, at Fort Kent.

Wind.—Prevailing direction, northwest.—*J. Warren Smith, Weather Bureau, Boston, director.*

NEW HAMPSHIRE.

(See New England.)

NEW JERSEY.

Temperature.—The mean was 1.8 below the normal; maximum, 62, at Cape May C. H., Millville, and Woodbine, 18th; minimum, —11, at Decker-

town, 25th; greatest monthly range, 64, at Somerville; least monthly range, 46, at Oceanic.

Precipitation.—The average was 0.96 above the normal; greatest monthly, 6.17, at Newton; least monthly, 3.25, at Blairstown.

Wind.—Prevailing direction, northwest.—*E. W. McGann, Observer, Weather Bureau, New Brunswick, director.*

NEW MEXICO.

Temperature.—Maximum, 72, at Socorro, 21st; minimum, —18, at Chama, 14th; greatest monthly range, 70, at Las Vegas; least monthly range, 40, at Coolidge.

Precipitation.—Greatest monthly, 1.85, at Fort Wingate; least monthly, 0.05, at Las Cruces.—*H. B. Hersey, Observer, Weather Bureau, Santa Fe, director.*

NEW YORK.

Temperature.—The mean was 2.8 below the normal; maximum, 57, at Wedgwood, 17th, and at Varysburg, 28th; minimum, —31, at Saranac Lake, 24th; greatest monthly range, 80, at Saranac Lake; least monthly range, 46, at Arkwright.

Precipitation.—The average was 0.04 above the normal; greatest monthly, 6.66, at Leroy; least monthly, 0.92, at North Hammond.

Wind.—Prevailing direction, northwest.—*Prof. E. A. Fuytes, Dean of the College of Civil Engineering, Cornell University, Ithaca, director; R. M. Hardinge, Observer, Weather Bureau, assistant.*

NORTH CAROLINA.

Temperature.—The mean was 0.5 below the normal; maximum, 76, at Wilmington, 10th; minimum, —2, at Bakersville, 27th; greatest monthly range, 71, at Bakersville; least monthly range, 36, at Hatteras.

Precipitation.—The average was 0.57 above the normal; greatest monthly, 9.64, at Highlands; least monthly, 2.60, at Rockingham.

Wind.—Prevailing direction, southwest.—*Prof. Herbert B. Battle, Raleigh, director; C. F. von Herrmann, Observer, Weather Bureau, assistant.*

NORTH DAKOTA.

Temperature.—The mean was 2.4 above the normal; maximum, 55, at New Salem, 26th; minimum, —40, at Portal, 20th; greatest monthly range, 84, at Portal; least monthly range, 60, at Fargo, Grand Forks, and Wahpeton.

Precipitation.—The average was 0.38 below the normal; greatest monthly, 0.80, at Saint John; least monthly, trace, at several stations.

Wind.—Prevailing direction, northwest.—*B. H. Bronson, Observer, Weather Bureau, Bismarck, director.*

OHIO WEATHER AND CROP SERVICE.

Temperature.—The mean was 2.2 below the normal; maximum, 76, at Portsmouth, 9th; minimum, —15, at Milligan, 5th; greatest monthly range, 81, at Coalton; least monthly range, 53, at several stations.

Precipitation.—The average was 1.08 below the normal; greatest monthly, 4.70, at North Lewisburg; least monthly, 1.16, at Bucyrus.

Wind.—Prevailing direction, southwest.—*L. N. Bonham, Columbus, director; C. M. Strong, Observer, Weather Bureau, assistant.*

OKLAHOMA.

Temperature.—Maximum, 75, at Kemp, 18th; minimum, —15, at Fort Supply, 25th; greatest monthly range, 77, at Enid; least monthly range, 56, at Alva and Guthrie.

Precipitation.—Greatest monthly, 10.80, at Buffalo; least monthly, 0.46, at Anadarko.

Wind.—Prevailing direction, north.—*J. I. Widmeyer, Observer, Weather Bureau, Oklahoma City, director.*

PENNSYLVANIA.

Temperature.—The mean was 2.4 below the normal; maximum, 64, at at Pittsburg, 9th; minimum, —24, at Dyberry, 25th; greatest monthly range, 73, at Dyberry; least monthly range, 48, at Altoona and Harrisburg.

Precipitation.—The average was 0.02 below the normal; greatest monthly, 5.59, at Reading; least monthly, 1.62, at Greenville.

Wind.—Prevailing direction, northwest.—*Under direction of the Franklin Institute, Philadelphia: W. P. Tatham, director; T. F. Townsend, Local Forecast Official, Weather Bureau, assistant.*

RHODE ISLAND.

(See New England.)

SOUTH CAROLINA.

Temperature.—The mean was 1.1 below the normal; maximum, 76, at Charleston, 10th, and at Trial, 19th; minimum, 16, at Hollands Store, 6th; greatest monthly range, 56, at Hollands Store; least monthly range, 37, at Timmonsville.

Precipitation.—The average was 0.27 above the normal; greatest monthly, 6.61, at Trenton; least monthly, 2.88, at Cheraw.

Wind.—Prevailing direction, southwest.—*J. W. Bauer, Observer, Weather Bureau, Columbia, director.*

SOUTH DAKOTA.

Temperature.—The mean was 1.2 below the normal; maximum, 65, at Tyndall, 28th; minimum, —26, at Hotch City, 12th; greatest monthly range, 80, at Tyndall; least monthly range, 58, at Bowdle and Sioux Falls.

Precipitation.—The average was 0.37 below the normal; greatest monthly, 2.25, at Oelrichs; least monthly, trace, at a number of stations.

Wind.—Prevailing direction, northwest.—*S. W. Glenn, Local Forecast Official, Weather Bureau, Huron, director.*

TENNESSEE WEATHER AND CROP SERVICE.

Temperature.—The mean was 3.7 below the normal; maximum, 73, at Chattanooga, 9th; minimum, 4, at Trenton, 26th; greatest monthly range, 61, at Trenton; least monthly range, 43, at Springdale.

Precipitation.—The average was 3.80 above the normal; greatest monthly, 12.14, at Covington; least monthly, 3.70, at Strawberry Plains.

Wind.—Prevailing direction, north.—*J. B. Marbury, Local Forecast Official, Weather Bureau, Nashville, director.*

TEXAS.

Temperature.—The mean was 2.2 below the normal; maximum, 94, at Fort Ringgold, 12th; minimum, —9, at Coldwater, 12th; greatest monthly range, 77, at Fort Hancock; least monthly range, 43, at McGregor.

Precipitation.—The average was 0.76 below the normal; greatest monthly, 6.61, at Orange; least monthly, 0.00, at Forts Clark and Hancock.

Wind.—Prevailing direction, north.—*D. D. Bryan, Galveston, director; I. M. Cline, Local Forecast Official, Weather Bureau, assistant.*

UTAH.

Temperature.—Maximum, 68, at Saint George, 27th; minimum, —34, at Randolph, 23d; greatest monthly range, 75, at Thistle; least monthly range, 37, at Salt Lake City.

Precipitation.—Greatest monthly, 4.70, at Silver Lake; least monthly, 0.19, at Fort Du Chesne.

Wind.—Prevailing direction, northwest.—*G. N. Salisbury, Observer, Weather Bureau, Salt Lake City, director.*

VERMONT.

(See New England.)

VIRGINIA.

Temperature.—Maximum, 74, at Norfolk, 10th, and at Richmond, 9th; minimum, 7, at Hot Springs and Warsaw, 25th; greatest monthly range, 62, at Warsaw; least monthly range, 47, at Cape Charles.

Precipitation.—Greatest monthly, 7.50, at Birdsneest; least monthly, 2.25, at Christiansburg.

Wind.—Prevailing direction, north.—*Dr. E. A. Craighill, Lynchburg, director; J. N. Ryker, Observer, Weather Bureau, assistant.*

WASHINGTON.

Temperature.—The mean was 3.9 below the normal; maximum, 61, at Fort Simcoe, 28th; minimum, —17, at Pullman, 22d; greatest monthly range, 65, at Ellensburg; least monthly range, 23, at Tatoosh Island and Fort Canby.

Precipitation.—The average was 0.57 below the normal; greatest monthly, 16.52, at Neah Bay; least monthly, 0.32, at Davenport.

Wind.—Prevailing direction, south.—*H. F. Alciatore, Observer, Weather Bureau, Seattle, director.*

WEST VIRGINIA.

Temperature.—Maximum, 74, at Point Pleasant, 9th; minimum, —5, at Pleasant Hill, 24th; greatest monthly range, 65, at Pleasant Hill; least monthly range, 48, at Elkhorn.

Precipitation.—Greatest monthly, 7.48, at Beverly; least monthly, 2.05, at Cloverdale.

Wind.—Prevailing direction, west.—*H. W. Richardson, Observer, Weather Bureau, Parkersburg, director.*

WISCONSIN.

Temperature.—The mean was 1.5 below the normal; maximum, 60, at Whitehall, 28th; minimum, —35, at Butternut, 24th; greatest monthly range, 83, at Butternut; least monthly range, 48, at Madison.

Precipitation.—The average was 0.50 below the normal; greatest monthly, 1.95, at Sharon; least monthly, 0.15, at Osceola.

Wind.—Prevailing directions, southwest and northwest.—*W. L. Moore, Local Forecast Official, Weather Bureau, Milwaukee, director.*

WYOMING.

Temperature.—Maximum, 64, at Wheatland, 27th; minimum, —32, at Sheridan, 21st; greatest monthly range, 78, at Sheridan; least monthly range, 65, at Fort Yellowstone.

Precipitation.—The average was 0.09 above the normal; greatest monthly, 2.30, at Labarge; least monthly, 0.10, at Laramie.

Wind.—Prevailing direction, west.—*E. M. Ravenscraft, Observer, Weather Bureau, Cheyenne, director.*

INLAND NAVIGATION.

STAGE OF WATER IN RIVERS.

The following table shows the danger point at each river station; the highest and lowest stages for the month of February, 1894, with the dates of occurrence, and the monthly range:

Heights of rivers above low-water mark, February, 1894.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
Red River.	Feet.	Feet.		Feet.		Feet.
Shreveport, La.	29.2	18.9	28	5.4	6	13.5
Arkansas River.						
Fort Smith, Ark.	22.0	13.8	13	3.2	1, 2	10.6
Little Rock, Ark.	23.0	21.0	13	6.5	2, 3	14.5
Missouri River.						
Pierre, S. Dak.	13.0					
Sioux City, Iowa*	18.7					
Kansas City, Mo.†	21.0	8.8	25	6.6	17	2.2
Mississippi River.						
St. Paul, Minn.	14.0					
La Crosse, Wis.	10.0					
Dubuque, Iowa*	16.0					
Davenport, Iowa*	15.0					
Keokuk, Iowa*	14.0					
Hannibal, Mo.	17.0	3.4	6, 7	0.8	13	2.6
St. Louis, Mo.	30.0	6.4	11	0.2	3	6.2
Cairo, Ill.	40.0	37.0	16	13.4	4	23.6
Memphis, Tenn.	33.0	29.4	20	9.6	4	19.8
Vicksburg, Miss.	41.0	40.3	27	16.3	7, 8	24.0
New Orleans, La.	13.0	13.2	27, 28	5.7	1	7.5
Ohio River.						
Parkersburg, W. Va.	38.0	24.0	13	8.6	4	15.4
Cincinnati, Ohio	45.0	35.6	15	17.2	4	18.4
Louisville, Ky.	24.0	12.9	14	7.7	1	5.2
Cumberland River.						
Nashville, Tenn.	40.0	41.9	10	9.3	1	32.6
Tennessee River.						
Chattanooga, Tenn.	33.0	25.5	6	4.9	3	20.6
Knoxville, Tenn.	39.0	15.4	5	2.3	2	13.1
Monongahela River.						
Pittsburg, Pa.	22.0	14.8	11	3.8	27	11.0
Savannah River.						
Augusta, Ga.	32.6	30.9	16	7.8	4, 10	13.1
Willamette River.						
Portland, Oregon	15.0	8.4	11	4.2	27	4.2

Heights of rivers—Continued.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
Susquehanna River.	Feet.	Feet.		Feet.		Feet.
Harrisburg, Pa.	17.0	6.0	12	2.0	6-9	4.0
Alabama River.						
Montgomery, Ala.	48.0	27.1	16	3.5	3	23.6
James River.						
Lynchburg, Va.	18.0	5.3	5	1.5	1, 2	3.8
Sacramento River.						
Red Bluff, Cal.	22.0	13.0	20	4.0	14, 17	9.0
Sacramento, Cal.	25.0	22.5	21, 22	18.5	16	4.0
Des Moines River.						
Des Moines, Iowa*	19.0					

* Frozen.

† For 15 days.

FLOODS.

The above table shows that in the rivers here recorded the nearest approaches to the danger line have been at Little Rock, Ark., on the 13th; Cairo, Ill., on the 16th; Sacramento, Cal., on the 21st and 22d; New Orleans, La., on the 27th and 28th.

The only notable flood was in the Cumberland River which reached the danger line on the morning of the 9th, attained its maximum on the 10th, and was below the danger line on the morning of the 11th.

NAVIGATION OF RIVERS AND HARBORS.

The weekly "bulletin of snow lying on the ground" gives reports of ice in rivers and harbors, and shows that on Monday, February 5, the ice in the Mississippi River varied from 10 inches at Hannibal, Mo., to 20 or 22 inches at La Crosse, Wis., and St. Paul, Minn.; in the Missouri River it varied from 3 inches at Kansas City, Mo., to 30 inches at Bismarck, N.

Dak., and 24 inches at Williston, N. Dak. On the Great Lakes there were from 4 to 6 inches in the harbors of lakes Ontario, Erie, and Michigan, 8 inches on Lake Huron, and 22 inches on Lake Superior, at Duluth, Minn. These conditions remained with but little change throughout the month. On Monday, the 26th, the reported thickness of ice, in inches, was as follows:

Hudson River.—Albany, N. Y., 14.

Upper Mississippi River.—St. Paul, Minn., 24; La Crosse, Wis., 28; Dubuque, Iowa, 12; Davenport, Iowa, 12; Keokuk, Iowa, 12; Hannibal, Mo., 6.

Missouri River.—Williston, N. Dak., 42; Bismarck, N. Dak., 28; Pierre, S. Dak., 29; Sioux City, Iowa, 18; Omaha, Nebr., 14; Kansas City, Mo., 4.

Arkansas River.—Fort Smith, Ark., 10; Dodge City, Kans., 2.

Platte River.—North Platte, Nebr., 16.5.

Red River of the North.—St. Vincent, Minn., 24.

Atlantic Coast.—Block Island, R. I., 3; New Haven, Conn., 4; Portland, Me., 3.

Lake Ontario.—Oswego, N. Y., 9.5; Rochester, N. Y., 6.5.

Lake Erie.—Buffalo, N. Y., 10; Erie, Pa., 10; Cleveland, Ohio, 6; Sandusky, Ohio, 8; Toledo, Ohio, 6.3; Detroit, Mich., 9.5.

Lake Huron.—Port Huron, Mich., 9.5; Alpena, Mich., 16.

Lake Michigan.—Grand Haven, Mich., 11; Chicago, Ill., 4; Green Bay, Wis., 15.

Lake Superior.—Sault Ste. Marie, Mich., 36; Marquette, Mich., 9; Duluth, Minn., 29.5.

The following special reports have also been collected:

Lake Superior.—Marquette, Mich., 21st, ice moving out of harbor; 22d, harbor clear of ice, except back of breakwater.

Lake Michigan.—Grand Haven, Mich., 20th, for the first time during the winter ice is obstructing navigation; slush ice fills the harbor and extends about 5 miles out into the lake. The steamer *Wisconsin* remained in port, unable to force her way through; 21st, the steamer *Roanoke* is reported fast in the ice 3 miles out; 24th, southeast winds cleared the harbor of ice and enabled the steamer *Roanoke* to enter port; 27th, immense floes of ice cover the lake, and the Milwaukee boat failed to make her way through and returned to port; 28th, navigation stopped by immense fields of ice.

Lake Huron.—Port Huron, Mich., 1st to 5th, floating ice in the St. Clair River; 6th, an ice gorge formed in the St. Clair at Marysville, 6 miles south of Port Huron; 9th and 11th, floating ice in the St. Clair; 22d, an ice gorge formed one-half mile below the city.

Missouri River.—Hermann, Mo., gorge broken on the 7th and ice moving out; 12th, heavy floating ice; 15th, frozen; 18th, opened again; 21st, heavy floating ice.

Illinois River.—Ottawa, Ill., 9th, ice passed out.

Ohio River.—Marietta, Ohio, 1st to 9th, heavy floating ice; 17th to 18th, floating ice. Parkersburg, W. Va., 1st to 6th, floating ice; 26th, floating ice. Wheeling, W. Va., 1st to 8th and 26th to 28th, floating ice; 1st to 4th, floating ice in Allegheny River.

Susquehanna River.—Lock Haven, Pa., 1st, river frozen; 10th, ice moved out; 16th, frozen.

Atlantic Coast.—New York, N. Y., 15th, the first floating ice of the season in the North and East rivers; 27th to 28th, floating ice in North and East rivers. Vineyard Haven, Mass., 25th, harbor frozen over, but ice broken by tide during day. Portland, Me., 23d to 28th, ice in harbor.

OBSERVATIONS ON THE GREAT LAKES.

Owing to the closing of navigation on the Great Lakes during the winter season the Weather Bureau has received reports for the month of February from no vessels and from only 10 U. S. Life Saving stations.

SUNSHINE AND CLOUDINESS.

Although the quantity of sunshine, and probably of heat, received by the atmosphere above the cloud layer is very nearly constant from year to year, yet it varies with the day and the month. On the other hand, at the surface of the earth, the distribution of sunshine and, therefore, the resultant heat with its meteorological and biological consequences depends mostly on the distribution of cloudiness.

Sunshine.—During the month an instrumental record of the amount of sunshine has been kept at 15 stations by means of the photographic sunshine recorder, and at 21 stations by means of the thermometric sunshine recorder. The results of these observations are given in Table IV, which shows the actual sunshine received, on the average, for any hour of local mean time (not seventy-fifth meridian time) during the month; the actual sunshine is tabulated as a percentage of the greatest possible duration of sunshine.

The stations recording the largest percentage of sunshine between the hours of 11 a. m. and 1 p. m., are: Colorado Springs, Colo., 87.5; Denver, Colo., 87; Key West, Fla., 91; Portland, Me., 85.5; Tucson, Ariz., 91. The stations having the least percentage are: Cleveland, Ohio, 45.5; Galveston, Tex., 45.5; Memphis, Tenn., 42; New Orleans, La., 46; Portland, Oreg., 28.5; Savannah, Ga., 42.5.

The next to the last column of Table IV gives the general average sunshine for the whole month for all hours of daylight. The highest percentages are: Key West, Fla., 84; Tucson, Ariz., 82; San Diego, Cal., 81. The lowest averages are: Galveston, Tex., 38; Memphis, Tenn., 39; New Orleans, La., 35; Portland, Oreg., 23.

Cloudiness.—The number of clear and cloudy days and the average cloudiness between sunrise and sunset (the latter

based on numerous personal observations) are given for each Weather Bureau station in Table I. The complement of the average cloudiness gives the observer's estimated percentage of clear sky, and these numbers are given in the last column of Table IV. On the average these personal estimated percentages are lower by 10.8 than the sunshine recorded by the thermometric registers and lower by 9.1 than the photographic registers.

Although the general average difference between the instrumental registers and personal records is about the same for both classes of instruments, yet this agreement needs an explanation. There is necessarily a systematic difference between the instrument and the observer, resulting from the fact that the observer estimates the average area of the sky covered by clouds at any moment, and his final percentage for the day, therefore, embraces the whole sky, whereas the instrument records essentially the visibility of the sun's disk, from which is derived the percentage of duration of sunshine. It is easily conceivable that a small bank of cloud slowly moving across the sky might keep the instrument in its shadow and cause a record of "no sunshine," whereas the observer viewing the whole sky would record that but a few tenths are covered by clouds. In general, in climates where but few clouds exist, an observer's record of one, two, or three tenths will almost invariably accompany an instrumental record of full sunshine. In this respect the various methods of recording differ among themselves as though they had varying degrees of sensitiveness: on clear and fair days the observer seems to be most sensitive to the presence of cloud, but the instrument less so: in cloudy weather the observer seems most sensitive to the presence of sunshine and the instru-

ment less so. This peculiarity is well brought out by arranging the instrumental and personal records according to the clearness of the sky.

Photographic register.					Thermometric register.				
Sunshine.		Cloudiness.		Difference.	Sunshine.		Cloudiness.		Difference.
Instru- mental.	Per- sonal.	Instru- mental.	Per- sonal.		Instru- mental.	Per- sonal.	Instru- mental.	Per- sonal.	
82	64	18	36	18	84	60	16	40	24
81	61	19	39	20	70	61	30	39	9
75	54	25	46	21	68	54	32	46	14
66	54	34	46	12	67	42	33	58	25
66	53	34	47	13	63	56	37	44	7
56	43	45	57	13	59	45	41	55	14
54	51	46	49	3	58	45	42	55	13
51	46	49	54	5	57	50	43	50	7
50	42	50	58	8	56	43	44	57	13
47	44	53	56	3	54	41	46	59	13
45	38	55	62	7	54	36	46	64	18
42	32	58	68	10	54	37	46	63	17
39	34	61	66	5	52	46	48	54	6
38	38	62	62	0	50	50	50	50	0
23	24	77	76	-1	49	40	51	60	9
					48	39	52	61	9
					48	41	52	59	7
					47	36	53	64	11
					44	41	56	59	3
					44	38	56	62	6
					35	33	65	67	2

In the above table the general monthly averages given in the last two columns of Table IV, for February, are thus rearranged separately for the thermometric and photographic re-

cord, and beside the percentages of sunshine, as there given, I have also added the complementary percentages of cloudiness.

After smoothing down the local discrepancies we see that in clear climates the observer gives the cloudiness full weight, and possibly overestimates it while the instrument may underestimate it, but for cloudiness of 60 or 70 per cent the observer and instrument agree, and probably would continue to do so very closely for the higher percentages.

There is no necessary agreement between a single instrumental register and the observer at any given station, but, in general, if many registers were closely and uniformly distributed within a few square miles near the observer and under the clouds that he records, then the average of all these registers should agree with the personal record. The practically close agreement between the average of all the personal and instrumental records at our widely-separated stations depends upon the fact that the clouds have an average motion and distribution that are very much the same everywhere, so that the percentage of duration of sunshine at any station and the percentage of geographical area that enjoys the sunshine agree closely in the monthly and annual averages, though they may differ widely on any given day or hour. The local sunshine record is undoubtedly the most important datum in the study of local agricultural or phenological questions. The average percentage of cloudiness is the most important datum for the study of the distribution of temperature and ascending currents in the atmosphere.

NOTES BY THE EDITOR.

SNOW IN NEW ENGLAND.

With regard to the question of diminished snowfall in New England, Miss Ellen D. Larned, of Thompson, Conn., says:

My records have some bearing. In addition to my own forty years' observations I have a family diary dating back to 1817, with some unfortunate lapses. These records give the date and general characteristics of snowfalls, but not usually the depth or amount. In copying from them I omit the light falls and flurries occurring more or less from October to May, and only note snows covering the ground and definite storms.

1817.—No snow of any perceptible amount till December 21; violent northerly snowstorm, but not much snow; very cold.

1818.—January 10, first sleighing of the winter; about 4 inches of snow fell; very good sleighing for so little snow; snowed sharp for a few hours; sleighing continued till March 2. March 28, much of a snowstorm; good sleighing for several days. November 18, snowed large and moist; no sleighing the following winter, save a few days after a violent storm of sleet and rain.

1819.—February 25, a succession of moderate snows. Snow on March 6, 8, and 9 made good sleighing. 16th, severe storm; coldest day of winter; excellent sleighing for a week. October 25, snowed all night. November 28, snowed all night and the next day, but no sleighing. December 30, a cold, tedious snowstorm, wind very high. 31st, high cold wind, snow blows violently; poor sleighing.

1820.—January 11, a violent snowstorm. 17th, most violent snowstorm, wind very high. 22d, snowed in the morning; sleighing improved. February 9, most violent storm all day; no stirring about; greatest fall of snow this winter; roads all blocked up. 10th, heavy fall of snow in the night. 11th, snows in the morning; blows hard; roads all filled up. 12th, all hands breaking roads; a thaw follows, but not sufficient to mar the sleighing. March 4, pretty good sleighing. 8th, snow, hail, and rain violent all day. 9th, rain continues. 10th, trees very heavily laden, snow slips off without much damage. 12th, cold and clear; roads have frozen, and crust to bear up horses, sleighs, and teams. 16th, good sleighing. 17th, snows prettily. 19th, snow falls, almost all gone, but it went to return with renewed force in the autumn. November 12, Sunday, snows in the night and all day; a right wintry, cold storm; no meeting; snow about 8 inches or more on the level. 13th, very cold, snowy morning, some rain or sleet, clears off at noon; hard sleighing. 14th, break into the woods with sled and haul two loads of wood; sleighing and sledding continued through the week. This November snowstorm of 1820 was handed down to posterity as exceeding in severity anything ever before experienced by the oldest inhabitant so early in the season, and it is believed that the record in this vicinity, at least, remains unbroken.

1821.—January 7, a terrible, cold snowstorm; first sleighing. 14th, very high, rough storm of snow. 22d, snows about 4 inches in the night. Febru-

ary 6, sleighing gone. 15th, snows again; pretty good sleighing, continuing some days. November 30, snowed all day, light; high wind. December 14, first sleighing, pretty good but rough, duration doubtful.

1822.—Good sleighing reported early in February. 18th, snows all day. 21st, very rainy, high freshet. December 3, snows hard in the night; folks began to sleigh, but could not keep it up.

1823.—January 1, violent blowing storm; resumed sledding. 5th, violent storm of snow and hail. 19th, snow wastes fast; violent rain. February 3, more snow and sleighing. 12th, deep snow and very level. 14-15th, very great snowstorm; a man perished on the meadow. 24th, a violent snowstorm all day; roads terribly blocked up; all hands out to shovel. March 2, threatens to thaw. 3d, cold as Greenland and grows colder all day. 6th, violent rain and snow. 20th, snow; good sleighing.

1823-1829.—For these six years there is no record. It is during this interval that I am inclined to place a snowless term of years referred to in family reminiscences as the time when snowstorms were supposed to have permanently gone out of fashion and people talked of selling their sleighs.

1829.—November 14, snow, changing to rain. 16th, snows considerable; remarkably warm Christmas weather; twelve days all fine and warm.

1830.—January 25, term of snow. February 3, sleigh ride to Woodstock. 10th, great sleigh ride. 22d, sleighing done. March 23, snow. 26th, violent storm of snow all day. December 6, first winter snow. 19th, snow all day; good sleighing.

1831.—January 9, snow all day; no going to meeting. 15th, violent snowstorm, badly drifted; no service in church. 22d, snow all day. 23d, very cold and blowy; no sleighing nor getting about, only on foot. February 1, snow. 3d, another furious storm, some rain; sleighing continues to 25th; children taken to school on horseback. November 22, heavy snow; good sleighing continues till January 15. Coldest December ever known.

1832.—February 5, snow; sleighing till March 1. March 18, snows again. April very cold, with frequent snows to the 26th. Snow December 1 and 15.

1833.—January warm and pleasant. 25th, snow and sleighing. 31st, very hard snowstorm. February 6-7, harder storm. March 1, very severe snowstorm; could not see across the road; no such weather ever before seen in March; coldest of the season. 16th, very muddy. October 30, coldest weather ever known in October. November 4-6, winter like. 25-26th, snows considerable; some sleighing. December 17-18, moderate snows; sleighing.

1834.—January 1, great sleigh ride. 18th, snow gone. February 7, snow all day. April 1, snows violently. 11-17th, extremely warm. October 7, brilliant rainbow in the northwest just after sunrise. 26th, p. m., heavy shower. 31st, snowed several hours. December 13, snows. 14th, more violent snowing. 15th, the thermometer said to be 18½° below zero. 24th and 25th, more snow and sleighing. 29th and 30th, another violent snowstorm.

1835.—January 4, most remarkably cold; said to be 20° below zero. 14th, sleighing gone. February 6, snows. 15-16th, tedious snowstorm; sleighing

again. March 2, very cold. 7-10th, violent snowstorms; sleighing. 19th, snow. 22d, snow, rain, hail, thunder, and lightning. 23d, sleighing continuous. 30th, snow. April 13-15, snowstorm. 25th, snow. November 23, snow and tolerable sleighing. 30th, snows all day; very cold month. December 12, snows; very cold. 17th, more so; very, very cold; temperature 14° below zero. 22d, good sleighing.

1836.—January 17-18, snowstorm. 25th and 31st, snowed. February 8, tremendous storm; roads all banked up. 17th, more snow. 26th, snow. March 10, hard rain; hard traveling; bridges carried off. 22d, snow; good sleighing till the 28th; in all about four months sleighing; many snow banks left. April 6-13, tedious snowstorms. November 3, snow. 17th, snowstorm. 25th, squally and cold.

1837.—January 1, snow and sleighing. 18th, snow. 21st-22d, hard snowstorm. 25th, very remarkable red auroras. Quiet snows and sleighing through February. March 2, great sleighing party. 19th, very cold. 22d, cold and tedious storm; trees loaded with ice. April 1, cold, frozen rain. 2d, cold. 8th, rain and thunder all day. 9-10th, hail. 16th, cold rain. May 1, ground frozen hard. 5th, rain and thunder showers all day and evening. November 14, cold, blowing snowstorm all day. 22d, snow all day. December 10, snows. 14th, severe storm. 25th, snows all day.

1838.—January 9th, snows; warm month; snows turned to rain. Sleighing in February. March 8, heavy snowstorm. 15th, snowstorm. 27-29th, snowed and melted. April 14, snowstorm; cold and snowy to 24th. October, 28-29th, snowed moderately. November 8, hard storm; very cold. 18th, cold snowstorm. 24-25th, extreme cold. December milder, with slight snows.

1839.—January 4, snowed, but soon melted; very fine and spring like, then snow and very cold; temperature 11° below zero. 26th, violent southeast rainstorm; variable season. February 9, snow. April, dry and warm early in month. 12-18th, cold storm, rain and snow. Autumn mild. December 15, tremendous snowstorm. 16th, wind increased all day; snow very deep; fine day followed, but roads impassable. 23d, another violent snowstorm. 27th, snowed again. The amount of snow falling in these incessant storms exceeded anything reported by the oldest inhabitant; business and social intercourse were virtually suspended, and the roads were so heavily packed that it seemed impossible to force a passage. A pamphlet published in Boston tells of the "awful calamities" occurring during the "dreadful hurricanes" on December 15, 21, and 27, with great loss of life and destruction of property.

1840.—Began very cold. January 11, snows all day. 13th, snow; a day made memorable by the burning of the steamer *Lexington* on its passage from Stonington to New York. February 4, 5, extremely cold. 16th, family resumed church-going; sunny and mild days followed; the snow passed off without damage. 20th, snow nearly gone. March 4, very warm, with thunder. 6-16th, cold, high winds. 15th, snow. 22d, very cold. 24-25th, snowstorm. April 1, snow. November 15, 18, 26, reported snowfalls. December 17, 18, snow; very cold; cold weather; snows and sleighing continued through the month.

1840-1852.—During this period the journal lapses. Records from 1852 to recent date will be furnished hereafter.

LUNAR HALOS.

Dr. J. R. Finney, voluntary observer at Fort Berthold, N. Dak., gives the following description of a lunar halo seen on the night of February 11, 1894, as a remarkable example of compound halo:

The whole sky was covered for a few minutes. The phenomenon appeared at 8.50 p. m., and for twelve minutes was very distinct; a large number of luminous circles and "mock moons" were plainly visible, but three circles and eleven "mock moons" were very bright and prominent, the rest being easily traced but not very distinct. There was no wind; the temperature was -16°; and the moon was about 11° above the horizon. Large distinct crosses were formed which gave the sky a wonderfully unique and beautiful appearance.

This phenomenon grew very indistinct at the end of twelve minutes, and at the end of half an hour only three paraselenae and two circles could be detected. These disappeared at the end of fifty minutes.

As the diagram forwarded by Dr. Finney can not be reproduced, it may be described as representing that a large portion of the sky was covered at regular intervals, systematically, by small crosses of horizontal and vertical rays intersecting at a corresponding bright spot, or "mock moon;" these spots were about 22° apart, horizontally and vertically, and therefore represent the intersections of circles of 22° radius; the principal circles had their centers at the moon and in the horizontal circle passing through that luminary, while the others were vertically above these. Twenty such bright spots arranged in four horizontal rows, of five each, are shown on Dr. Finney's diagram.

The observer at Oil City, Pa., noted that on February 21, 10 p. m.:

High toward the zenith in the east, a huge cross, white in color and indescribably brilliant, blazed in the sky, while the moon, encircled by a similar light, made a beautiful center piece. At each corner of the cross appeared to be huge balls of living fire of all colors of the rainbow. The phenomenon lasted for nearly half an hour.

POGONIP.

The "Pogonip" is described in the "American Meteorological Journal," Vol. iv, p. 105, and in the "Annual Report of the Nevada State Weather Service" for the year 1892. It is an Indian word, applied to a mist of ice crystals or frozen fog particles that occurs most frequently in the southeastern part of White Pine County, Nevada. Many sections of the State are entirely free from the "pogonip." In Mr. Friend's report, above quoted, the phenomenon is said to be caused by the mixture of warm air from the valley rising up into a cold wind that is generally blowing lengthwise in the valley; the freezing fog descends and clothes every thing with minute frost crystals. A "pogonip" at Winnemucca, in January, 1892, lasted from the 22d to the 25th, and deposited a coating of ice needles to a depth of two inches upon trees, bushes, fences, buildings, men, and cattle. In Virginia City the observer, being generally above this layer of mist, states that—

It came suddenly; appeared in its greatest beauty on the morning of January 22; filled up the valleys and rolled up the mountain sides, leaving the tops of the largest hills like islands and rocky headlands; its waves tumbled over each other and rolled over its shores; late in the afternoon its surface was much agitated by some unknown impulse causing its great waves to roll to the westward; they took on a yellow hue, where they tumbled over the eastern mountain rim of the city; Sugar Loaf Mountain became a cone-shaped island, with falls on each side of it. The canyons were slowly filled and the vapor surged up the sides of Mount Davidson, partly covering the city, and causing intense cold where there had been sunshine and warmth before. It soon receded to its first situation, where it remained until broken up after four days of beautiful existence.

By referring to the daily maps and to the REVIEW for January, 1892, we perceive that at this time Nevada was under the influence of the area of high pressure No. VIII, whose central highest was northeast of Virginia City; there was a gentle flow of cold upper air westward and southwestward over the plateau region and this air was apparently slowly descending and cooling by the local radiation that is facilitated by its dryness and clearness. When the air near the ground is quiet it cools below its dew point and thus forms an icy fog, or "pogonip," that is colder than the layer immediately above it, not only during the nighttime, but especially in the daytime, when the upper surface of the fog stops all the heat from the sun.

Similar cases of such cooling and ice mist are occasionally observed at many other places, and probably they occur very generally whenever at sunrise a cold, thin mist prevails near the earth's surface; in such cases for several hours after sunrise the temperature near the surface of the earth still remains very low; there seems to be no warmth in the sun's rays until after their heat has entirely dissipated the thin haze of frozen fog.

Thus, at Washington, D. C., November 19, 1891, after a cloudless night, the air being very dry, cold, frosty, and calm in the center of a high area, a mist had formed about 8 a. m., increasing to a high haze, and up to 10 a. m. there was still no heat in the sun's rays. On a foggy or hazy summer morning the low-down sun is warm, but not so this morning. The moisture in the air was probably now in the shape of crystals or spherules of ice, the sun's heat was being used up in melting this ice, and, therefore, it did not warm the air above us, much less that near the ground; after melting the ice the solar heat must warm and evaporate the resulting water, and the air can attain only to the temperature of the wet bulb until all is vaporized. During the nighttime the still air had allowed much ice in the form of small particles to form in the atmosphere and settle down near the ground, so that at 8 a. m. the lower stratum of air contained much more to be

melted and evaporated than it did at the previous sunset, and much more than the stratum just above it. Therefore, this morning the lower air was more hazy than on the 18th and the cold lasted longer after sunrise; only after the lower air had become thoroughly warmed, and had risen and mixed with the upper air, could the haze disappear and the normal temperature and dryness return. The frost work in high winds on mountain tops apparently differs from that of the "pogonip" and low lands mostly in that the latter is formed by radiation in still air, while the former is due to thermodynamic cooling in ascending air.

CHINOOKS AND HOT WINDS.

In striking contrast to the "pogonip" that prevailed during January 21-26, 1892, in Nevada, under the slowly descending winds from high pressure No. VIII, was a "chinook" wind that occurred a few days before, viz, on January 18 and 19, 500 miles to the northeast, in Montana, and on the northeastern side of the same area of high pressure, but where the outflowing winds from the southwest were rapidly instead of slowly descending, and were, therefore, being warmed by compression faster than they could be cooled by radiation.

In September, 1890, and as a suggested reply to a letter from Senator Plumb, of Kansas, relative to an investigation of the hot winds of that State, the present editor used the following language:

These winds affect a large part of the country east of the Rocky Mountains, and are not peculiar to Kansas. * * * With regard to the cause and origin of the hot winds the following statement is the best that I am at present able to give:

With clear, dry air we usually have hot days and cool nights, but during the hot winds of Kansas the nights are frequently nearly as hot as the days; the hot winds frequently begin at night and blow continuously day and night. The fact that they blow from the south naturally suggests that they consist simply of hot surface air from northern Texas; but as the air seems to grow hotter as it flows northward from Texas, and as there are very few cumulus clouds in this air, notwithstanding the fact that it is rising slowly, it has been concluded that there must be some descending dry, warm air mixing with the ascending hot surface stream, and thus preventing the production of cloud. Now the descent of air warms it up, as in the föhn winds of Switzerland, so that a slowly descending layer of air over Kansas may contribute several degrees to the warmth and much to the dryness of the air. This descending air may have come from the Pacific coast over Mexico or California, or British Columbia; either is possible, the latter more likely, and the fact that July, 1890, shows a surplus of rain on the Pacific coast is entirely consistent with the excessive heat that occurred in Kansas and Nebraska, as shown on the charts in the WEATHER REVIEW for that month.

Nothing can be done to avoid or avert these hot winds, and the direful consequences to agriculture can only be diminished by supplying an abundance of water to the roots as soon as a hot wind sets in, and by sheltering both soil and leaves, especially the latter, from the direct sun's heat; a very dry wind, or great heat without the wind, wilts the leaves by evaporating the juices faster than the roots can supply the sap.

WARM REGIONS IN CYCLONES.

Not only are the chinook, the föhn, and the hot wind of our western plains familiar illustrations of the general principle of the dynamic warming of descending air, but in general the relation between ascending and descending winds attending the movement of successive cyclonic and anticyclonic areas over the United States is such that south and southwest of the area of lowest pressure, in the region where the rare and light air of the southwest winds is about to be succeeded by the denser and heavier air of northwest winds, we find in many cases a rather long and narrow region separating these two winds, and within which there temporarily prevails clear sky, higher temperatures, light winds or calms. This region, which over the land is usually elongated northward and southward, and is probably influenced somewhat by local topography, corresponds closely if not exactly to the so-called "eye" of the storm in tropical hurricanes; they both owe their existence to the same mechanical processes, so that the difficulties that have been felt by some in explaining the mechanism of the eye of the storm disappear when we come to consider the phenomenon experienced in

ordinary land storms. The region of temporary clearing away of the clouds, with the hot, moist, sultry air and light winds, is sometimes very strongly marked to observers at Washington, and, in fact, along the entire eastern slope of the Appalachians, but as it has also been observed by me on the western slope of this range, I conclude that the mountain ranges and local topography play only a minor part in accentuating some features of the mechanism. Many typical cases of this phenomenon have been noted by me at Washington, but the most striking one seems to have been the severe storm of November 23, 1891.

The following notes were made by me, and the times, as given by my watch, are probably correct within two minutes. Up to 12.30 p. m. there was a surface wind and lower clouds, small cumuli, from the southeast; above this a blue sky, except for some high cirrus clouds moving from the southwest. At 12.32 a rain gust began at the Weather Bureau, with southeast wind, and from a south-southeast lower cloud. At 12.33 the lower clouds were seen to be changing their motion and coming from the south, while a denser low cloud was visible to the westward, rapidly approaching; it arrived within a minute; the surface wind suddenly blew violently from the south and then from the southwest; the rain changed to snow and was carried northeastward aloft, visibly over the southeast wind; the barometer suddenly rose. At 12.43 clear sky was visible in the southwest beyond the cloud; shortly afterward this cloud bank passed entirely overhead to the eastward, and as seen then its western side presented the appearance of a ridge of towering cumuli. Clear sky and warm light winds prevailed until 3.50 p. m., then a cloud bank rose in the west and northwest, and cooler northwest winds came in; this second cloud bank was preceded by many rolls arranged in parallel rows trending northeast and southwest.

As I interpret these events, the warm, clear space that required three hours to pass over the observer represented the region in which that general downpour of air was going on, by means of which the area of opposing southeast wind was being pushed eastward by the following northwest wind; the first cloud bank represented the front edge of this downpour where the southeast wind was pushed up and to a slight extent mixed with the incoming wind, but eventually made to flow over on itself toward the northeast; the high cirri seen at 12.30 above the smaller cumuli, and which were trending and moving toward the northeast, represented this overflow. We may thus characterize the entire system of circulation as follows:

A. On the eastern side of the first cloud bank we have a lower southeast wind, in which small cumuli are formed at some distance from the cloud bank, and others of larger size as we approach the latter, which, in fact, towers up at *B* to the greatest height, and overflows as cirrus, *C*, toward the northeast, thinning out into dissolving cirri as it flows onward.

D. On the western side of the cloud bank, and at this time 50 or 100 miles away, we have at the surface of the ground a northwest wind rolling up; as it advances southeastward down the general slope of the Appalachians it is forming small cumuli, *E*, that overflow from the southwest.

F. The broad interval between *B* and *E* is filled principally with the overflow from the latter; each portion of the northwest wind that is pushed up by the many irregularities of the earth's surface over which it has to flow, becomes in its turn an overflow and veers from a northwest wind below to a southwest wind above; these upper overflows from *E* slide rapidly down along surfaces of equal density until they reach the ground, where they either rest quietly or continue flowing gently from the southwest; therefore, geographically speaking, the region *F* precedes the region, *D*, of northwest winds and is cloudless and warm.

The upper portion of the region, *F*, just described is at the level of the top of the cirri, *C*, in the overflow region above *A*, so that both *C* and *F* flow on together from the southwest to northeast.

The shape and dimensions of the warm, clear region, *F*, and its location with reference to the isobars, depend not only on the topography of the ground, but also especially on the general characteristics as to temperature, moisture, and pressure within each of the two systems of wind; we have at one extreme a long, narrow area dividing southeasterly from northwesterly winds, in which case the clear, warm region is correspondingly long and narrow, or V-shaped; or we may have a symmetrical cyclonic arrangement of the winds, with a descending overflow from the northwest wind confined to a small central region, as in the "eye" of the hurricane, which phenomenon has been observed by me on every occasion on which a hurricane center has passed over or near Washington; or, finally, and this is the more common case, the local orographic features of the land break up the surface winds into patches of northwest, southeast, etc., so that there are formed simultaneously several separate regions of warm air and clear sky between corresponding systems of winds that are more or less opposed to each other. Opposing winds will not flow toward a central region, *F*, unless, in general, some slight deficit of pressure exists therein, but when they meet and push each other upward a portion of the kinetic energy is transformed into static pressure, or the so-called potential energy. The region, *F*, of descending and warm, clear air represents this general region of lowest pressure, and the formation of the heavy cloud bank, *B*, is attended by a sudden increase of pressure at the earth's surface, notwithstanding the fact that at the base of and within the cloud there may be an upward current and a diminution of pressure. Such a sudden increase of static pressure is frequently shown by self-registering barometers, and must always occur when the motion of a rapid current of air is suddenly checked by an opposing current or by the earth's surface.

THE AURORA POLARIS.

The extensive aurora of the 22d and 23d has necessitated a consideration of the many diverse views that have been expressed as to the nature of this phenomenon and its bearing on meteorology. The editor, therefore, submits his conclusion that this must not be considered as an electric display high above the clouds of the earth's atmosphere and rendered visible by the clear sky attending an area of high pressure, but on the contrary as a display whose seat or locus was in the lower atmosphere near at hand, sometimes below the clouds, and whose very occurrence depended upon the existence of an area of dry and cold air overlaid by a moister atmosphere, in which a slight condensation of vapor was going on. As condensation into hail and rain attends lightning, so condensation into snow crystals is attended by broad but silent flashes, and the condensation into a delicate haze of ice spiculæ accompanies the aurora. The atmosphere and its moisture are always in an electrified condition and preparing for an electrical discharge, but the nature of the discharge will depend upon the condition of the air as to temperature, humidity, and possibly dust and barometric pressure.

In 1872, in connection with the notable aurora of February 4 (see Bull. Phil. Soc., Wash., Vol. 1, p. 45), the present writer stated that the aurora stands in an intimate relation to the condition of the earth's atmosphere; that, in fact, although the ultimate cause of the electrified condition of the earth and its atmosphere may be ever acting, may be cosmical or solar, and may, therefore, be subject to periods of one, or eleven, or fifty-five years, yet, on the other hand, that electricity can not produce its visible effect, the aurora, except in certain conditions of the earth's atmosphere and that, therefore, certain remarkable relations exist between auroral

phenomena and terrestrial storms, some of the details of which he then briefly indicated. In connection with the aurora of April 6, 1874, it was shown that the display emanated from a very low and not an elevated region. In editing the appendices to Professional Paper No. III, of the Signal Service, I inserted the data as to the frequency of clear or cloudy nights alongside of the data as to frequency of auroras, in order that the relation between these two meteorological phenomena might be more completely elucidated. The statistics show that it is unreasonable to assume that the aurora is often above but hidden by the clouds and more reasonable to conclude that for each station there is no aurora at all unless the sky is clear or clearing away as to the lower clouds; the presence or formation of thin haze is more likely to accompany than to prevent auroras. The special cases there quoted of instances wherein auroral light has been observed quite close to the observer have since then been supplemented by several additional cases of a similar character. It is important to bear in mind these general conclusions as to the very low altitude of the auroral light, in order that our meteorological data may be properly brought to bear on the study of auroral data, such as presented in the monthly tables of the REVIEW. The interpretation by general statistical methods of such masses of rather crude data as the auroral reports usually afford is not likely to lead us to the unknown laws of nature until we have attained some knowledge as to the origin of the phenomena and the real physical connection between them.

The present aurora appears to have had an intimate connection with an area of high pressure and clear air that extended northward beyond our stations and had brought from distant regions such a condition as to temperature, moisture, and electricity that it was doubtless possible for the auroral discharge to continuously take place night and day in its northern and central portions, but in the southern portions, although the electrified vapor was present in the layer whence the aurora emanated, yet the temperature needed to be still further lowered a little by nocturnal radiation. The electric equilibrium of the atmosphere when seriously disturbed is soon restored by a few discharges; it is only when the disturbance is perpetually renewed that the discharges become correspondingly frequent; the slight electrical disturbance possibly produced in the atmosphere during the daytime of the 21st, 22d, and 23d over the auroral region, conjoined with the greater disturbance brought into this region by the area of high pressure, was relieved by the auroral discharge within a few hours on the evenings of the 22d and 23d as soon as the nocturnal radiation had brought the atmosphere into the proper condition for the formation of ice spiculæ.

This radiation goes on simultaneously, but the necessary result is attained later in the evening at some stations than at others. This general retardation results from the fact that both the atmosphere and the soil at the southern stations are warmer than at the northern; moreover, on account of the snow lying on the ground the nocturnal radiation from the surface into the air is greater at the southern stations, so that for both reasons the southern stations require a greater time for the lower air to cool. For the same reason as well as because of the excess of moisture and the retardation due to the mixture of the wind, the layer that finally reaches the necessary temperature and humidity is higher up at the southern than at northern stations. This accords with the general observation that the display of the 22d seems to have taken place comparatively high in the atmosphere over the Pacific States, and that of the 23d comparatively high at the southern and eastern boundary of auroral visibility, but both appeared always lower down and with many more details as to motions and beams, curtains and waves, arches and colors in the dry regions of the central portions of the area of high pressure.

METEOROLOGICAL TABLES.

[Prepared by the Records Division.]

Table I gives, for 140 Weather Bureau stations making two observations daily and for 10 others making only the 8 p. m. observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation.

The stations are arranged in geographical or climatological divisions, for each of which the mean temperature and average precipitation for the month are also given, together with their departures from normal values.

Generally the headings of the several columns are sufficiently explicit as to the data underneath.

The mean pressure is based on the 8 a. m. and 8 p. m. simultaneous observations. Mean values thus computed differ from the mean of the 24 hourly readings by amounts varying from zero to 0.02 of an inch; the departures east of the ninetyeth meridian are generally above the mean of 24 hourly readings and those west of that meridian are generally below. A comparison for each individual station can readily be made in connection with the data given in Table VI.

The pressures have been reduced to sea level by the empirical method published by Prof. H. A. Hazen in Signal Service Professional Paper No. VI, which, however, has been further modified for a few special stations.

The mean temperature of the dew point and the mean relative humidity are based on daily observations of the whirled psychrometer at 8 a. m. and 8 p. m.

The maximum wind velocities given in the table are the velocities as read from the sheets of the register for any 5-minute period in the 24 hours, midnight to midnight, seventy-fifth meridian time.

The number of clear and cloudy days and the average cloudiness are based upon numerous personal estimates by the observer during the daytime and do not relate to the nighttime.

When these personal estimates give from 0 to 3 cloudiness, on a scale of zero to ten (0—10), the day is classed as clear; 4 to 7, partly cloudy; and 8 to 10, cloudy.

Table II gives, for about 2,200 stations occupied by voluntary observers, the extreme maximum and minimum temperatures, the mean temperature deduced from the average of all the daily maxima, and minima, or other readings, as indicated by the numeral following the name of station; and the total monthly precipitation.

For the sake of uniformity the monthly mean temperature has been deduced from readings of self-registering maximum and minimum thermometers whenever practicable. Formerly the means obtained by the use of observations at 7 a. m., 2 and 9 p. m. were printed in this table, whenever given, in preference to those deduced from the daily extremes.

These stations are arranged alphabetically by States, and their reports are generally received through the co-operation of the respective State Weather Services. The voluntary stations in the Republic of Mexico and those in the West Indies are included in this list for convenience of tabulation.

Table III gives, for about 30 Canadian stations, the mean pressure, mean temperature, total precipitation, prevailing wind, and the respective departures from normal values. Reports from Newfoundland and the Bermudas are included in this table for convenience of tabulation.

The mean pressures and temperatures here given are based

upon observations made simultaneously for telegraphic purposes at 8 a. m. and 8 p. m., seventy-fifth meridian time; the pressures have been reduced to sea level by the Weather Bureau method and, therefore, differ slightly from those reduced by the method employed by the Canadian Meteorological Service.

Table IV gives for 36 stations the percentages of hourly sunshine as derived from the automatic records made by two essentially different types of instruments, designated, respectively, as the thermometric recorder and the photographic recorder. The kind of instrument used at each station is indicated in the table by the letter T or P in the column following the name of the station.

The thermometric recorder operates on the principle of a Leslie differential air thermometer, one of the bulbs being blackened. It is fully described in the "American Meteorological Journal," Vol. ix, pp. 345-349. The record is produced electrically whenever the intensity of the sunshine surpasses a certain minimum limit and is sufficient to cause a mercurial column to rise above the upper of two platinum wires. The intensity of sunshine above this limit is not recorded. The instrument is adjusted by trial and observation so that a record will just be made when the cloudiness is not sufficient to quite obscure the disc of the sun. Denser cloudiness than this, so that the exact form of the sun's disc can not be seen with the unaided eye, will cause an interruption of the record.

The photographic recorder operates on the principle of Jordan's recorder. The record sheets for this instrument are sensitized each month with the ordinary blue-print solution, and are generally used only for a period of fifteen days, a new sheet being then introduced, but the instrument can be used for a whole month's record without changing the sheets.

Neither of these instruments will record satisfactorily the duration of the sunshine for about one hour after sunrise and one hour before sunset and, on this account, it has been considered necessary to apply to the recorded hours of sunshine what has been designated a "twilight correction." The amount of this correction is found from a table of the time of sunrise and sunset, noting, in connection therewith, the time of beginning and ending of sunshine on the automatic record. This correction is applied when we know, by personal observation, the comparative clearness of the sky at the time of sunrise or sunset, as the case may be.

Although the action of the thermometric recorder is based on the heating effect of the sun's rays, while that of the photographic recorder is based on the actinic effect, it is found there is not a very great difference between the two instruments. In general, however, the photographic recorder does not give such good results at stations where rain is more or less frequent and with comparatively high relative humidities, since under these conditions the sensitized paper deteriorates.

Although the thermometric recorders are regulated by standard eastern time, and the photometric recorders by a sun dial or local apparent time, yet the readings from the record sheets are adjusted to local mean time. The last column gives the percentage of sunshine deduced by taking the complement of the local observer's estimate of cloudiness, which latter is published in Table I.

Table V gives for 79 stations the mean hourly temperatures deduced from thermographs of the well-known pattern manufactured by Richard Bros., Paris, described and figured

in the report of the Chief of the Weather Bureau, 1891-'92, p. 29. These instruments are placed in the standard shelter with other thermometers, and are checked twice daily, for time errors and for agreement with the standard whirled thermometer.

In transcribing the hourly values, the readings of the dry-bulb thermometer of the whirled psychrometer at 8 a. m. and 8 p. m. are adopted as the standard of reference, and these standard readings are given in the appropriate columns of Table V. Corrections for intermediate hours, interpolated from the known differences at 8 a. m. and 8 p. m., are applied to the curve throughout the twenty-four hours, thus making it conform as closely as practicable to the indications of the standard mercurial thermometer. The averages given in this table are, therefore, those of the standard dry thermometer at 8 a. m. and 8 p. m., and the corrected thermograph reading for intermediate hours.

In general the magnitude of the corrections applied is about 1° Fahrenheit, although a number of instruments accord with the standard dry thermometer within less than a degree.

As has been noted elsewhere, the greatest differences are those between the daily extremes registered by thermographs and by standard self-registering maximum and minimum thermometers, respectively.

Table VI gives for 68 stations the mean hourly pressures (seventy-fifth meridian time) as automatically registered by barographs of the pattern manufactured by Richard Bros., Paris, except for Washington, D. C., where Foreman's barograph is in use. Both instruments are described in the Report of the Chief of the Weather Bureau for 1891-'92, pp. 26 and 30.

The readings of the mercurial barometer at 8 a. m. and 8 p. m., seventy-fifth meridian time, corrected for temperature and instrumental error, are used as a means of checking and correcting the barograph curve, in the same manner as described in the table of temperature means, and are those given in this table.

The corrections applied to the individual hourly barograph readings vary in magnitude. The average is about 0.02 of an inch, while in extreme cases it may be 0.06 or 0.08 of an inch, depending somewhat on the individual skill of the observer in keeping the instrument in adjustment.

The means have not been reduced to sea level, neither has a correction to reduce to standard gravity been applied.

Although the mean pressures are given in this table to the nearest thousandth of an inch, yet it is probable that these figures still need appreciable systematic corrections, therefore, as in the case of so many other similar European series, caution should be exercised in using them for the investigation of diurnal periodicities of pressure. The adopted process of reduction to the standard mercurial barometer prevents the accumulation of any progressive error, whether due to the time scale or to the vacuum box, but does not inform us of any periodic errors that may have occurred within the 12-hour periods. On this latter point we have only the little knowledge that is given to us by a general investigation into the effect of temperature on these aneroids. In this respect Prof. Marvin's experiments have shown that, although the manufacturer has introduced a compensation for temperature (presumably by introducing some air into the vacuum box), yet this result has not always been perfectly satisfactory. Several aneroids have been found to show higher pressures when the instrumental temperature rises, while others do the reverse. In a number of cases a rise of 10° F., in the instrumental temperature produces a fall of 0.010 or 0.015 of an inch in the recorded pressure.

In general, it is safe to assume that any one of the Richard

barographs at Weather Bureau stations is liable to a temperature correction of this amount, although the average of several instruments would undoubtedly be much smaller. Since the highest temperature, and, therefore, the largest plus or minus correction for temperature, generally occurs some time after the 8 a. m. reading, and *vice versa*, the lowest temperature with the largest minus or plus correction occurs before the 8 a. m. reading; therefore, there is introduced into every daily barograph record an error that will be either positive between 8 p. m. and 8 a. m., and negative between 8 a. m. and 8 p. m., or *vice versa*. The average amount of the maximum value of this error for a month, varying as it does with the temperature of the room in which the aneroid is kept, may easily amount in the winter season to 0.02 of an inch, but when station barometers are located in large buildings of uniform temperature the limit will diminish. It is evident, therefore, that these hourly means can not be used for determining by the harmonic analysis the shorter and smaller periodicities, although they sometimes give the semi-amplitude of the principal simple daily component to within 0.01 of an inch, or less. To this extent, therefore, these may be cautiously used in the study of both the geographical and chronological distribution of this first component, a study whose importance undoubtedly warrants the preparation and publication of this table from month to month. Some of the results of such studies will be published in subsequent numbers of this REVIEW.

Table VII gives for 142 stations the arithmetical means of the hourly movements of the wind ending with the respective hours, as registered automatically by the Robinson anemometer, in conjunction with an electrical recording mechanism, described and illustrated in the Report of the Chief of the Weather Bureau, 1891-'92, p. 19. No corrections have been applied to reduce the registered velocities to true velocities.

In studying the diurnal variations of wind movement, the following facts should be kept in mind. In graduating the dials of the various sizes of Robinson anemometers, it has been assumed by the makers that the centers of the cups move only one-third as fast as the wind, although numerous experiments have demonstrated that cups and arms of various proportions require different formulæ and tables of reduction even in perfectly steady motion. Prof. Marvin has further shown that for ordinary gusty winds, when the anemometer cups rapidly vary their rate of rotation, the moment of inertia of the revolving parts is a most important factor. The instruments having the least inertia record most truly, and those having large inertia exceed these in proportion as the gusts are stronger, consequently, the anemometer records are liable to be too large in the gusty winds of the daytime as compared with the more steady winds of nighttime. No correction for this inertia error has been determined, nor can be, unless we have simultaneous records with two anemometers having different moments of inertia; therefore, the apparent diurnal variations of wind velocity include a slight inertia error which is probably periodic in character between the winds of daytime and nighttime.

While we must regard the gustiness of the ordinary wind, that is, its sudden and momentary fluctuations of velocity, as highly variable, yet in practical anemometry we can not do more than make an average allowance for its effects upon an anemometer.

For the ordinary gusty winds of the free atmosphere Prof. Marvin adopts the following equation expressing the relation between the motion of the cups and the velocity of the wind at any moment:

$$\text{Log. } V = 0.509 + 0.9012 \log. v;$$

where V is velocity of wind in miles per hour and v is the

linear velocity (also in miles per hour) of the cup centers. This equation applies strictly to anemometers that have 4-inch hemispherical brass cups on arms 6.72 inches long, whose revolving parts weigh about 590 grams (22 ounces) and have a moment of inertia of about 50,000 C. G. S. units.

This equation has been deduced from comparative observations in the open air of anemometers whose behavior in steady velocities on the whirling machine had been previously studied. The recognition thus given the important effects of inertia enables us to say that by applying this formula, or the following equivalent table, we partly annul the influence of the inertia of brass anemometers used by the Weather Bureau.

The following table gives the corrected velocities corresponding to observed velocities up to 90 miles per hour. The tabular values corresponding to indicated velocities greater than 60 miles per hour are uncertain, as direct experiments were not made at the higher velocity:

Wind velocities, as indicated by Weather Bureau anemometer, converted to true velocities (in miles per hour).

Indicated velocity.	0	1	2	3	4	5	6	7	8	9
0.....						5.1	6.0	6.9	7.8	8.7
10.....	9.6	10.4	11.3	12.1	12.9	13.8	14.6	15.4	16.2	17.0
20.....	17.8	18.6	19.4	20.2	21.0	21.8	22.6	23.4	24.2	24.9
30.....	25.7	26.5	27.3	28.0	28.8	29.6	30.3	31.1	31.8	32.6
40.....	33.3	34.1	34.8	35.6	36.3	37.1	37.8	38.5	39.3	40.0
50.....	40.8	41.5	42.2	43.0	43.7	44.4	45.1	45.9	46.6	47.3
60.....	48.0	48.7	49.4	50.2	50.9	51.6	52.3	53.0	53.8	54.5
70.....	55.2	55.9	56.6	57.3	58.0	58.7	59.4	60.1	60.8	61.5
80.....	62.2	62.9	63.6	64.3	65.0	65.8	66.4	67.1	67.8	68.5
90.....	69.2									

Table VIII gives the resultant movements of the winds for 68 stations of self-registration as deduced from the continuous record for every hour of the month. The contents of the columns are as follows:

Column 1—the name and number of the station, the latter being the same as in tables I and IX for convenience of reference. Columns 2 and 3—the direction and duration of the prevailing wind, viz, that observed most frequently.

Columns 4 and 5—the total movement in all directions for the whole month and the average hourly movement corresponding thereto. Column 6—the resultant direction, assuming the wind to have always a uniform velocity. Column 7—the duration in hours of this resultant direction, considered as a wind that has blown with the average velocity. Column 8—the approximate average hourly velocity in this resultant direction, found by dividing the resultant movement of column 10 by the resultant duration of column 7. Column 9—the direction of the resultant movement, computed by using the miles actually traveled each hour, as read from the registers. Column 10—the amount of the resultant movement in miles. Column 11—the azimuth of the resultant movement minus the azimuth of the resultant direction; these azimuths are counted around the circle from zero at the south through 90° at the west, and if the azimuth of the resultant movement is greater than that of the resultant direction, the difference in column 11 is called positive; the azimuth of the movement is equal to that of the direction plus the positive, or minus the negative differences. Column 12—the ratio of the resultant movement in column 10 divided by the total movement in column 4; this ratio would be unity in the ideal case of wind blowing from one direction only, but would be zero in the ideal case of equal opposing winds.

Table IX gives for 140 stations, or all that make observations at 8 a. m. and 8 p. m. (seventy-fifth meridian time), the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind in miles. The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in each geographical division one may obtain the average resultant direction for that region. From these resultant directions one may pass to the resultant movement, at least approximately, by applying the average corrections indicated by column 11 of Table VIII.

TABLE I.—Climatological data for Weather Bureau Stations, February, 1894.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.		Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.			Mean temperature data since opening of station.															
			Mean pressure, S. a. m. and P. m. + 2.	Mean reduced.	Departure from normal.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.	Mean temperature of the day.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with or more.	Total movement, miles.	Prevailing direction.	Maximum velocity.	Clear days.	Partly cloudy days.	Average cloudiness, in tenths.	Highest for month.	Year.	Lowest for month.	Year.									
New England.																																	
Eastport	76	21	29.98	30.07	+ .11	25.1	19.0	2.8	43	18	26	14	24	12	32	8	63	5.42	0.4	9,497	nw.	50	se.	15	8	11	9	5.8	27.5	1877	16.7	1875	
Portland	103	23	29.98	30.09	+ .08	20.2	12.6	4.5	43	18	29	15	25	12	34	13	73	2.70	0.9	9,574	nw.	32	se.	13	7	11	10	5.8	31.5	1877	19.2	1875	
Northfield	872	7	29.14	30.16	+ .10	12.6	4.5	4.4	48	18	24	15	25	1	46	4	71	1.54	1.0	6,631	n.	40	se.	16	10	9	9	5.5	22.2	1890	11.6	1889	
Boston	125	24	29.99	30.13	+ .08	25.6	19.0	1.2	51	18	34	15	24	19	34	17	68	3.15	0.4	8,771	n.	49	se.	12	7	11	10	5.9	33.2	1890	20.5	1885	
Nantucket	14	8	30.11	30.12	+ .02	29.6	25.8	1.6	47	18	34	15	24	25	27	24	79	3.11	0.0	9,538	n.	58	se.	13	7	10	11	6.0	35.0	1890	27.9	1889	
Woods Hole	16	16	30.11	30.12	+ .02	29.6	25.8	1.6	47	18	34	15	24	25	27	24	79	3.11	0.0	9,538	n.	58	se.	13	7	10	11	6.0	35.0	1890	27.9	1889	
Vineyard Haven	8	8	30.11	30.12	+ .02	29.6	25.8	1.6	47	18	34	15	24	25	27	24	79	3.11	0.0	9,538	n.	58	se.	13	7	10	11	6.0	35.0	1890	27.9	1889	
Block Island	27	14	30.11	30.14	+ .07	29.2	25.8	2.3	49	18	35	3	0	24	34	24	78	4.43	0.4	14,102	nw.	73	e.	13	8	11	9	5.9	37.2	1890	24.2	1885	
Narragansett Pier	12	12	30.11	30.12	+ .02	29.2	25.8	2.3	49	18	35	3	0	24	34	24	78	4.43	0.4	14,102	nw.	73	e.	13	8	11	9	5.9	37.2	1890	24.2	1885	
New Haven	107	22	30.02	30.14	+ .05	26.0	19.0	2.5	51	8	33	1	7	25	17	35	19	76	4.23	0.0	6,888	n.	40	se.	13	8	11	9	5.4	35.0	1877	19.7	1885
New London	45	24	30.11	30.16	+ .08	26.0	19.0	2.5	51	8	33	1	7	25	17	35	19	76	4.23	0.0	6,888	n.	40	se.	13	8	11	9	5.4	35.0	1877	19.7	1885
Mid. Atlantic States.																																	
Albany	88	21	30.08	30.15	+ .10	21.2	12.6	5.0	50	18	30	11	25	13	38	15	78	2.61	0.9	6,175	n.	35	se.	17	8	10	10	5.6	33.0	1884	14.7	1885	
New York, N. Y.	185	24	29.95	30.16	+ .04	20.6	12.6	5.0	52	8	36	1	25	23	33	22	75	5.15	1.4	8,235	nw.	42	nw.	16	6	11	11	6.2	40.4	1890	13.1	1885	
Harrisburg	377	0	29.74	30.17	+ .03	29.6	25.8	1.6	47	18	34	15	25	22	26	24	82	4.56	0.0	5,631	e.	40	nw.	16	6	8	14	6.4	37.6	1890	25.2	1889	
Philadelphia	117	24	30.03	30.16	+ .03	31.9	25.8	2.6	60	18	40	15	25	25	26	23	73	3.07	0.0	8,279	nw.	40	se.	26	5	11	12	6.3	41.4	1890	23.4	1885	
Atlantic City	53	21	30.09	30.14	+ .04	33.6	25.8	2.6	60	18	40	15	25	25	26	23	84	3.46	0.2	9,624	nw.	44	se.	13	8	4	16	6.7	41.2	1890	25.7	1885	
New Brunswick	24	24	30.15	30.15	+ .01	38.3	25.8	2.6	60	18	40	15	25	20	37	25	70	3.86	0.0	5,515	n.	42	nw.	16	9	11	8	5.5	43.4	1890	28.5	1885	
Baltimore	179	24	29.95	30.16	+ .04	20.6	12.6	5.0	52	8	36	1	25	23	33	22	75	5.15	1.4	8,235	nw.	42	nw.	16	6	11	11	6.2	40.4	1890	13.1	1885	
Washington, D. C.	112	24	30.03	30.16	+ .03	31.9	25.8	2.6	60	18	40	15	25	25	26	23	73	3.07	0.0	8,279	nw.	40	se.	26	5	11	12	6.3	41.4	1890	23.4	1885	
Cape Henry	179	24	29.95	30.16	+ .04	20.6	12.6	5.0	52	8	36	1	25	23	33	22	75	5.15	1.4	8,235	nw.	42	nw.	16	6	11	11	6.2	40.4	1890	13.1	1885	
Lynchburg	685	23	29.46	30.17	+ .03	43.0	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Norfolk	57	24	30.09	30.16	+ .02	49.9	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
S. Atlantic States.																																	
Charlottesville	773	16	29.30	30.15	+ .00	44.9	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Hatteras	11	14	30.15	30.16	+ .01	48.4	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Kittyhawk	9	8	29.74	30.17	+ .01	45.0	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Raleigh	388	8	29.74	30.17	+ .01	45.0	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Southport	34	19	30.13	30.16	+ .02	48.4	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Wilmington	78	24	30.08	30.17	+ .03	50.6	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Charleston	52	24	30.14	30.19	+ .04	52.8	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Columbia	206	23	29.98	30.21	+ .02	49.5	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Augusta	206	23	29.98	30.21	+ .02	49.5	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Savannah	98	24	30.08	30.19	+ .02	49.5	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Jacksonville	43	23	30.14	30.19	+ .04	50.8	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Florida Peninsula.																																	
Jupiter	28	7	30.16	30.19	+ .07	68.5	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Key West	22	24	30.17	30.19	+ .07	72.2	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Tampa	36	23	30.15	30.19	+ .07	72.2	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Titusville	44	7	30.16	30.20	+ .04	64.2	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Eastern Gulf States.																																	
Atlanta	1,131	16	28.96	30.19	+ .01	45.0	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Pensacola	56	15	30.09	30.15	+ .01	54.1	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,749	nw.	40	nw.	15	6	7	15	6.4	38.4	1890	44.4	1889	
Mobile	57	24	30.11	30.16	+ .01	53.0	25.8	2.6	60	18	40	15	25	25	26	23	82	3.31	0.2	6,74													

TABLE I.—Climatological data for Weather Bureau Stations, February, 1894—Continued.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.		Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.				Mean temperature data since opening of station.														
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Date.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with or more.	Total movement, miles.	Prevailing direction.	Maximum velocity.			Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Highest for month.	Mean temperature data since opening of station.					
																				Miles per hour.	Direction.	Date.						Year.	Lowest for month.	Year.			
Up. Miss. Val.—Con.																																	
Davenport.....	613	23	29.46	30.17	+ .06	22.1	- 2.5	50	30	- 6	21	14	30	79	1.48	- 0.2	6	6,749	sw.	36	sw.	10	11	10	7	4.3	40.3	1882	10.1	1875			
Des Moines.....	869	16	29.19	30.19	+ .06	20.5	- 2.3	54	27	30	- 8	21	11	33	14	78	1.39	+ 0.1	5	5,655	sw.	32	sw.	16	16	9	3	3.9	36.0	1882	14.6	1885	
Dubuque.....	651	21	29.41	30.16	+ .06	20.0	- 2.3	49	7	39	- 8	21	11	32	12	75	1.22	- 0.4	5	4,033	nw.	25	nw.	10	14	6	8	4.4	35.7	1882	6.1	1875	
Keokuk.....	613	23	29.47	30.17	+ .06	25.8	- 2.3	58	7	34	- 2	21	18	38	18	75	1.46	- 0.4	5	6,012	nw.	37	nw.	10	14	6	6	8	4.1	39.5	1882	16.5	1885
Cairo.....	359	23	29.76	30.17	+ .05	35.8	- 3.5	64	9	42	- 12	24	29	25	29	77	4.77	+ 0.6	10	8,177	n.	48	sw.	9	7	12	5.5	49.0	1882	31.9	1885		
Springfield, Ill.....	644	15	29.44	30.17	+ .04	26.2	- 5.0	55	27	34	- 3	16	18	32	19	76	2.58	- 1.2	8	7,510	nw.	35	sw.	9	11	4	13	5.7	42.2	1882	20.9	1885	
Hannibal.....	534	20	29.56	30.17	+ .04	27.0	- 5.4	54	27	35	- 4	16	19	40	19	75	2.51	- 0.8	8	7,099	w.	42	sw.	9	13	5	10	5.1	.....	.....	.....	.....
Saint Louis.....	571	24	29.53	30.17	+ .04	22.0	- 2.7	62	27	40	- 9	21	25	30	22	67	2.88	- 0.1	7	8,758	nw.	58	sw.	9	15	4	9	4.4	43.9	1882	26.0	1875	
Missouri Valley.																																	
Columbia.....	.....	.....	.....	.....	.....	29.6	.....	60	27	40	0	15	20	45	.....	.....	.....	7	5,575	nw.	32	w.	9	9	11	8	4.8	.....	.....	.....	.....
Kansas City.....	963	6	29.11	30.20	+ .06	27.2	- 4.9	59	27	34	- 1	15	20	33	20	79	2.42	+ 0.7	7	7,262	n.	36	sw.	17	9	10	5	5.7	36.8	1892	26.9	1893	
Springfield, Mo.....	1,356	9	28.67	30.17	+ .04	32.0	- 4.9	59	27	41	- 2	15	24	34	22	72	2.28	- 1.0	9	7,656	nw.	48	sw.	9	8	5	15	6.4	46.2	1882	32.0	1894	
Topeka.....	7	.....	.....	.....	.....	28.1	- 3.2	60	27	38	- 2	15	18	35	.....	.....	.....	1.34	- 0.4	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Omaha.....	1,123	24	28.95	30.23	+ .06	21.6	- 2.5	51	7	31	- 4	19	12	30	13	75	1.30	+ 0.5	4	5,266	nw.	22	sw.	16	11	12	5	4.6	37.3	1877	13.4	1875	
Valentine.....	2,613	8	27.30	30.21	+ .06	17.8	- 5.1	56	28	30	- 15	21	6	42	8	71	0.53	0.0	6	6,928	nw.	36	nw.	9	17	8	3	4.1	27.7	1888	12.6	1891	
Sioux City.....	1,165	23	28.80	30.20	.....	18.6	.....	48	26	28	- 10	19	9	34	12	81	0.19	.....	4	7,646	nw.	44	nw.	9	15	9	4	3.7	.....	.....	.....	.....
Pierre.....	1,470	28	28.50	30.18	.....	16.8	.....	60	28	28	- 14	12	6	42	10	81	0.04	.....	1	5,768	nw.	36	nw.	9	16	11	1	3.0	.....	.....	.....	.....
Buron.....	1,310	13	28.66	30.19	+ .02	10.6	- 2.5	44	28	22	- 18	12	1	41	5	85	0.24	- 0.2	2	9,418	nw.	48	sw.	24	17	6	5	3.6	24.7	1882	3.6	1887	
Northern Slope.																																	
Havre.....	2,477	14	27.32	30.10	- .06	15.2	+ 0.3	49	7	26	- 19	19	5	40	8	75	0.14	- 0.5	6	8,092	sw.	38	sw.	27	9	14	5	4.7	30.3	1886	- 2.6	1887	
Miles City.....	2,374	17	27.48	30.15	.....	10.7	- 5.5	48	28	24	- 25	11	- 2	42	6	88	0.07	- 0.4	2	1,558	n.	13	sw.	26	16	7	5	3.3	30.8	1878	- 7.5	1887
Helena.....	4,118	14	25.77	30.23	+ .08	16.3	- 6.1	48	7	24	- 15	.....	.....	.....	7	69	0.47	- 0.2	2	4,629	sw.	36	w.	16	11	6	11	5.2	35.0	1888	5.0	1887
Rapid City.....	3,280	9	26.60	30.17	.....	20.0	- 2.0	56	28	31	- 18	20	9	40	8	63	0.17	- 0.6	3	5,674	w.	44	w.	16	15	9	4	3.9	30.9	1882	16.4	1883
Cheyenne.....	6,105	23	23.90	30.29	+ .12	20.4	- 7.0	50	16	32	- 13	23	9	40	7	59	0.72	+ 0.4	6	8,292	w.	50	nw.	17	10	14	4	4.2	33.4	1886	18.9	1883	
Lander.....	5,377	23	24.57	30.29	.....	12.6	.....	49	28	28	- 28	20	2	50	2	68	0.92	.....	5	2,830	sw.	42	sw.	17	16	10	2	3.2	.....	.....	.....	.....
Kearney.....	2,206	20	27.77	30.24	.....	20.6	.....	54	26	32	- 12	13	9	40	10	67	0.99	.....	3	8,412	n.	48	n.	9	13	9	6	4.1	.....	.....	.....	.....
North Platte.....	2,841	20	27.12	30.26	+ .09	21.4	- 4.7	55	28	34	- 16	13	8	47	10	68	0.29	- 0.1	4	5,935	nw.	30	nw.	9	11	13	4	4.2	35.3	1878	16.8	1883	
Middle Slope.																																	
Colorado Springs.....	6,098	16	23.93	30.21	.....	22.9	- 8.0	53	16	36	- 6	11	10	45	6	55	0.65	+ 0.2	4	6,390	n.	64	w.	20	9	13	6	4.6	36.1	1888	22.5	1883
Denver.....	5,287	23	24.69	30.25	+ .09	24.9	- 8.1	55	16	38	- 6	11	12	47	7	48	0.90	+ 0.4	6	4,982	n.	40	nw.	17	11	11	6	4.6	38.6	.....	22.0	1883
Pikes Peak.....	14,118	17	17.45	.....	.....	- 0.4	.....	18	7	4	- 19	9	5	19	12	62	1.01	.....	9	18,507	w.	92	w.	16	9	10	9	5.5	7.9	1877	- 0.6	1880
Pueblo.....	4,734	6	25.22	30.22	.....	23.4	- 4.1	58	16	37	- 17	24	10	53	6	54	1.38	.....	7	4,735	w.	41	w.	20	12	12	5	4.4	35.8	1892	23.4	1894
Concordia.....	1,410	9	28.64	30.24	+ .07	24.8	- 4.1	63	7	39	- 4	14	13	38	14	75	1.36	+ 0.7	6	5,236	n.	35	sw.	16	17	7	4	3.6	34.0	1892	24.3	1887	
Dodge City.....	2,523	20	27.45	30.23	+ .09	24.3	- 8.0	60	28	35	- 5	13	14	38	14	71	1.03	+ 0.5	8	7,238	nw.	45	nw.	9	15	5	8	4.6	41.3	1876	24.3	1894	
Wichita.....	1,366	6	25.68	30.21	.....	28.0	.....	60	27	37	- 1	13	19	34	20	77	1.01	.....	6	7,115	n.	37	n.	19	13	4	11	5.2	38.5	1892	28.0	1894
Oklahoma City.....	1,239	.....	28.83	30.21	.....	34.8	.....	67	18	45	7	12	25	34	25	76	1.11	.....	5	7,505	n.	36	n.	19	11	7	10	5.1	.....	.....	.....	.....
Southern Slope.																																	
Abilene.....	1,749	9	28.31	30.21	+ .08	40.8	- 7.3	74	.....	51	15	12	31	46	28	70	0.75	- 0.4	2	8,315	nw.	42	w.	3	14	6	8	4.0	51.4	1890	40.8	1894
Amarillo.....	3,691	.....	26.27	30.21	.....	29.0	.....	62	18	39	1	12	19	36	15	63	1.15	.....	6	11,805	n.	60	w.	8	11	6	11	5.4	.....	.....	.....	.....
Southern Plateau.																																	
El Paso.....	3,796	16	26.23	30.16	+ .04	44.3	- 5.6	72	21	56	16	24	32	38	12	33	0.29	- 0.2	1	7,695	nw.	41	nw.	8	12	11	5	3.9	57.3	1879	44.3	1894	
Santa Fe.....	7,051	22	23.18	30.16	+ .07	26.2	- 6.7	48	21	35	0	24	17	32	12	58	1.11	+ 0.4	8	4,199	ne.	36	nw.	8	12	9	7	4.7	37.0	1879	24.2	1880	
Tucson.....	2,432	11	27.54	30.11	.....	47.3	- 5.9	75	28	62	20	11	33	40	23	47	1.04	+ 0.1	4	5,794	nw.	60	sw.	10	19	6	3	6.5	38.3	1879	47.2	1880
Yuma.....	141	19	29.93	30.08	+ .03	52.5	- 6.5	82	27	68	30	12	38	42	30	47	T.	- 0.4	0	4,954	ne.	52	nw.										

TABLE II.—Meteorological record of voluntary and other co-operating observers, February, 1894.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
Alabama.	°	°	°	Ins.	Arizona—Cont'd.	°	°	°	Ins.
Alec.....	78	25	52.4	.....	Wilcox.....	64	24	40.6	1.60
Auburn.....	72	21	48.4	9.78	Willcox.....	64	24	40.6	1.37
Birmingham.....	78	24	52.2	9.59	Yuma.....	80	40	51.7	0.00
Birmingham.....	70	24	48.8	4.49	Arkansas.				
Brewton.....	80	23	51.5	16.54	Arkadelphia.....	72	18	43.2	4.78
Carrollton.....	71	23	47.1	4.32	Ashdown.....	70	20	42.5	5.28
Citronelle.....	74	29	53.6	10.08	Bee Branch.....	75	20	45.0	9.28
Claborn Landing.....	76	19	46.0	8.20	Blanchard Springs.....	64	18	37.0	3.67
Clanton.....	76	19	46.0	8.20	Brinkley.....	71	22	43.6	6.52
Cordova.....	76	19	46.0	8.20	Camden.....	71	22	43.6	4.79
Demopolis.....	76	19	46.0	8.20	Camden.....	71	22	43.6	4.05
Eufaula.....	76	19	46.0	8.20	Cassville.....	57	13	39.0	6.66
Florence.....	69	14	41.8	6.44	Conway.....	63	24	41.4	8.23
Fort Deposit.....	74	23	51.0	10.44	Corning.....	65	15	36.3	6.52
Gadsden.....	73	21	46.3	7.36	Dardanelle.....	65	15	36.3	10.33
Geneva.....	80	28	54.4	13.05	Payetteville.....	65	7	36.3	5.27
Greensboro.....	75	23	47.2	5.61	Forrest.....	69	23	43.4	5.27
Healing Springs.....	78	21	47.7	8.24	Fulton.....	69	23	43.4	2.95
Highland Home.....	74	26	50.2	7.57	Gaines Landing.....	75	17	47.2	2.15
Livingston.....	74	26	50.2	7.57	Hamburg.....	75	17	47.2	3.57
Lock No. 4.....	74	26	50.2	7.57	Helena.....	67	18	40.8	7.53
Lynn.....	74	26	50.2	7.57	Hot Springs.....	70	20	42.3	9.92
Madison Station.....	72	18	47.9	5.57	Hot Springs (near).....	67	7	37.0	8.56
Maple Grove.....	74	16	48.2	4.48	Keesee Ferry.....	67	7	37.0	5.40
Marion.....	74	16	48.2	4.48	Kirby.....	65	19	41.4	9.45
Newbern.....	72	22	47.9	5.45	Lonoke.....	65	25	43.2	5.63
Newburg.....	73	14	42.4	5.33	Madding.....	65	25	43.2	3.88
Newton.....	77	26	51.2	14.81	Mount Ida.....	63	15	39.3	10.38
Opelika.....	71	12	48.9	2.22	Mount Nebo.....	51	10	30.9	8.31
Oxanna.....	68	23	47.4	5.98	New Gascony.....	68	22	43.5	4.84
Pine Apple.....	75	24	51.1	8.81	Newport.....	65	18	39.8	9.83
Pushmataha.....	75	27	50.3	7.65	Newport.....	65	18	39.8	8.81
Rock Mills.....	72	20	44.0	8.81	Ocala.....	67	9	39.8	6.25
Scottsboro.....	69	20	43.3	5.57	Ozark.....	67	17	41.8	6.78
Seima.....	75	24	49.9	11.51	Rison.....	70	16	43.8	5.46
Starling.....	75	24	49.9	11.51	Rogers.....	64	0	31.0	3.70
Sturdevant.....	75	24	49.9	11.51	Russellville.....	63	20	41.6	9.20
Talladega.....	73	15	46.4	5.68	Searcy.....	65	19	39.0	11.46
Talladega.....	73	15	46.4	5.68	Stuttgart.....	66	19	42.1	5.96
Talladega Falls.....	73	15	46.4	5.68	Texarkana.....	74	19	45.0	2.38
Tuscaloosa.....	77	20	46.4	4.73	Warm Springs.....	68	12	36.2	6.50
Union Springs.....	75	20	50.2	9.21	Washington.....	68	20	42.8	4.53
Uniontown.....	75	20	50.2	9.21	Wigwag.....	60	7	35.0	9.09
Valley Head.....	70	17	41.7	5.45	Winslow.....	60	7	35.0	5.70
Warrior.....	70	17	41.7	5.45	California.				
Wetumpka.....	70	17	41.7	5.45	Agnew.....	66	34	49.1	2.43
Wilsonville.....	70	17	41.7	5.45	Anaheim.....	75	35	51.9	0.35
Alaska.					Anderson.....	62	20	42.3	3.94
Killsnoet.....	41	7	24.7	8.25	Antioch.....	67	33	47.2	2.54
Metlakatla.....	43	9	31.4	16.03	Aptos.....	66	30	48.2	6.05
Arizona.					Arcata.....	59	25	42.8	6.91
Antelope Valley.....	74	25	48.1	0.20	Arlington Heights.....	75	29	48.9	0.21
Ariz. Canal Co. Dam.....	74	32	52.2	0.46	Athlone.....	74	35	49.8	3.78
Benson.....	75	28	51.5	1.50	Auburn.....	75	29	49.8	9.89
Bisbee.....	66	22	41.6	1.25	Bakersfield.....	67	33	45.3	0.00
Buckeye.....	69	26	52.2	0.50	Ballast Point L. H.....	72	22	45.6	0.60
Calabasas.....	69	10	42.7	0.75	Barstow.....	72	22	45.6	0.21
Casa Grande.....	69	10	42.7	0.75	Beaumont.....	80	28	45.0	0.29
Dragon.....	66	29	49.5	1.77	Belmont.....	70	40	57.1	2.61
Dragon Summit.....	66	29	49.5	1.77	Berendo.....	70	34	48.2	2.61
Dudleyville.....	78	24	48.0	1.17	Berkeley.....	60	34	46.6	3.77
Eagle Pass.....	71	21	43.7	1.63	Bethany.....	64	32	47.5	4.81
Farley's Camp.....	52	9	25.5	2.40	Bishop Creek.....	71	16	41.6	0.75
Flagstaff.....	52	9	25.5	2.40	Boca.....	70	15	28.3	7.55
Florence.....	66	28	50.0	0.74	Borden.....	72	32	47.3	1.89
Fort Apache.....	60	10	35.2	0.96	Boulder Creek.....	72	32	47.3	13.87
Fort Bowie.....	67	16	41.6	2.55	Brentwood.....	65	32	46.7	3.10
Fort Grant.....	67	16	41.6	2.55	Brighton.....	70	35	50.0	2.29
Fort Huachuca.....	69	18	41.3	2.06	Byron.....	65	29	45.5	2.65
Gila Bend.....	80	32	51.4	0.40	Caliente.....	67	31	47.8	1.40
Globe.....	70	24	44.8	1.46	Calistoga.....	66	30	49.1	7.82
Holbrook.....	63	5	35.3	0.61	Calloway.....	66	30	49.1	0.08
Keams Canyon.....	52	0	27.8	0.63	Campo Seco.....	66	30	49.1	5.83
Lochiel.....	64	14	41.3	1.28	C. Mendocino L. H.....	66	30	49.1	6.15
Maricopa.....	68	30	48.9	0.12	Capitola.....	68	32	49.8	2.34
Mount Huachuca.....	67	15	41.3	2.19	Castroville.....	65	25	50.0	4.99
Natural Bridge.....	67	15	41.3	2.19	Centerville.....	67	25	50.5	2.52
Navajo.....	65	22	42.9	1.99	Chico.....	70	28	46.2	0.61
Oro.....	65	22	42.9	1.99	Chino.....	69	27	45.5	0.61
Palomas.....	82	20	47.0	0.05	Cisco.....	37	6	24.0	1.53
Pantano.....	76	32	47.6	1.40	Claremont.....	68	29	46.2	1.22
Parker.....	79	13	47.7	1.95	Cloverdale.....	67	34	49.5	7.09
Payson.....	60	10	34.8	1.95	Colegrove.....	80	28	41.5	0.66
Peoria.....	75	30	48.7	0.40	Colton.....	70	30	53.0	0.55
Phoenix.....	74	22	47.1	0.34	Colusa.....	67	29	46.3	1.00
Phoenix.....	77	28	48.6	0.70	Corning.....	72	30	48.9	4.30
Red Rock.....	75	32	50.3	0.85	Covelo.....	67	30	48.9	8.51
Reymert.....	70	23	45.7	1.05	Crescent City.....	67	30	48.9	6.37
Rye.....	69	20	43.4	1.03	Crescent City L. H.....	67	30	48.9	6.35
St. Helena R. H.....	75	18	41.6	1.37	Crofton.....	84	32	48.9	0.84
San Carlos.....	75	18	41.6	1.37	Davisville.....	68	32	46.2	2.05
San Simon.....	78	27	53.1	0.00	Davisville.....	81	31	54.6	2.71
Show Low.....	74	25	45.7	0.35	Deep Creek.....	70	29	47.4	1.89
Signal.....	74	25	45.7	0.35	Delano.....	70	29	47.4	0.45
Texas Hill.....	74	25	45.7	0.35	Delta.....	68	24	44.8	3.70
Tucson.....	74	23	47.8	0.99	Dinuba.....	70	30	46.2	1.47
Tucson.....	75	30	50.0	0.30	Downey.....	80	32	53.5	0.80
Walnut Grove.....	65	16	39.3	2.34	Dry Creek.....	64	27	41.6	7.79
Walnut Ranch.....	65	16	39.3	2.34	Drytown.....	64	27	41.6	7.79
Whipple Barracks.....	64	7	28.6	0.30	Dunnigan.....	68	28	45.3	2.06

Meteorological record of voluntary observers, etc.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
California—Cont'd.	°	°	°	Ins.	California—Cont'd.	°	°	°	Ins.
Dunsmuir**	60	8	38.0	7.60	National City †	71	34	50.8	0.71
East Brother L. H.	58	8	33.6	1.26	Needles †	78	31	51.5	0.12
Edgewood**	58	8	33.6	0.50	Neenach †	75	16	40.1	.....
Edmonton**	52	10	29.4	16.48	Nevada City †	62	20	37.8	10.85
Eldorado**	70	30	46.0	11.90	New Almaden**	67	31	49.4	2.38
Elmira**	70	34	47.6	4.20	Newark**	58	36	47.1	3.43
El Verano**	67	31	47.8	4.97	Newcastle †	65	27	42.6	8.26
Emigrant Gap**	42	8	28.9	15.50	Newcastle b**	63	28	42.1	4.68
Escondido	75	33	53.6	0.50	Newhall**	78	22	45.8	0.29
Esparto**	67	34	46.2	2.85	Newman**	63	27	49.4	0.89
Evergreen	74	29	49.9	3.01	Niles**	64	32	46.7	5.97
Exeter	71	29	49.9	0.60	Nordhoff †	72	25	46.6	0.74
Fall Brook*1	71	30	45.8	1.10	Norwalk**	72	31	50.7	0.55
Farmington**	67	30	50.1	5.17	Oakdale a*1	66	27	44.2	5.21
Felton	80	28	52.1	12.78	Oakdale b**	65	28	45.6	5.20
Fernando**	70	30	45.7	0.61	Oakland a	65	35	47.8	3.70
Florence**	75	30	49.4	0.25	Oakland b**	56	34	45.0	3.50
Florin**	68	30	44.1	3.51	Ogilby**	79	36	53.9	0.00
Folsom City a**	67	35	47.1	6.15	Oleta*1	61	27	40.8	9.01
Folsom City b*1	68	32	47.5	6.40	Ontario a**	72	33	50.9	0.83
Fort Ross	65	26	44.4	6.60	Ontario b	74	30	46.6	1.00
French Corral	65	26	44.4	6.16	Orangevale †	69	30	46.0	6.14
Fresno**	79	32	49.9	2.95	Orland**	68	29	48.5	2.75
Fruto**	69	32	46.5	1.40	Oroville a**	68	34	49.1	3.21
Galt**	67	33	48.8	5.93	Oroville b	65	31	46.0	2.71
Georgetown †	64	22	39.4	16.25	Pajaro**	67	32	52.9	3.55
Gilroy**	68	30	48.2	3.04	Palermo †	69	28	44.8	2.34
Girard**	60	12	36.7	1.90	Palm Springs**	82	38	57.1	0.00
Glenora	68	28	46.1	8.70	Pasadena †	73	33	50.1	0.74
Glen Ellen**	68	28	46.1	8.70	Paso Robles a**	78	25	45.1	0.86
Gorman Station	70	28	47.4	1.64	Paso Robles b	70	25	46.1	0.59
Goshen**	70	28	47.4	1.64	Petaluma*1	71	36	49.5	3.22
Grass Valley a	66	26	43.7	2.49	Piedras Blancas L.H.	73	29	42.9	14.40
Green Valley	66	26	43.7	2.49	Pigeon Point L. H.	67	29	42.9	14.40
Gridley*1	66	26	43.7	2.49	Placerville a*1	62	22	39.2	13.02
Haywards**	55	32	45.9	3.60	Placerville b	80	28	48.4	4.84
Headsburg*1	62	30	41.9	6.08	Pleasanton a**	66	27	43.2	5.92
Hollister**	72	30	49.1	2.77	Pleasanton b	66	27	43.2	5.92
Hornbrook**	60	5	34.6	0.70	Pt. Ano Nuevo L. H.	65	31	46.0	4.35
Humboldt L. H.	65	32	51.0	0.35	Point Arena L. H.	70	28	45.1	5.36
Huron**	65	32	51.0	0.35	Point Bonita L. H.	68	31	46.7	4.70
Hyde Ranch	65	32	51.0	0.35	Pt. Conception L. H.	68	31	46.7	4.70
Hydesville †	60	24	42.1	5.90	Point Fermin L. H.	68	31	46.7	4.70
Independence †	60	24	42.1	5.90	Pt. Hueneeme L. H.	68	31	46.7	4.70
Indio**	60	24	42.1	5.90	Point Lobos	57	38	47.0	2.48
Ione**	63	29	44.2	6.03	Point Loma L. H.	65	28	44.8	0.23
Iowa Hill*1	66	23	40.4	12.25	Point Montara L. H.	65	28	44.8	0.23
Jackson	58	24	39.7	10.84	Point Pinos L. H.	65	28	44.8	0.23
Jolon	58	24	39.7	10.84	Point Reyes L. H.	65	28	44.8	0.23
Julian	58	24	39.7	10.84	Point Sur L. H.	65	28	44.8	0.23
Keeler**	65	25	40.8	0.29	Pomona**	72	28	45.1	1.10
Keene**	62	19	41.1	1.65	Pomona (near)	70	28	46.1	0.82
Kelseyville	77	26	46.1	6.56	Porterville**	72	31	49.3	0.83
Kennedy Gold	77	26	46.1	6.56	Port Los Angeles**	62	43	51.5	0.64
Mine	64	28	43.1	11.86	Poway**	62	28	43.4	1.29
King City**	70	28	47.0	0.66	Puente**	78	28	53.7	0.20
Kingsburg**	70	33	47.0	0.88	Ravenna**	77	24	44.5	0.10
Knights Landing**	68	32	44.6	1.64	Red Bluff**	69	31	44.9	2.83
Kono Tayee	63	29	43.7	4.32	Redding a**	68	30	47.1	7.65
Lagrange**	68	36	47.2	6.43	Redding b †	66	27	44.4	5.56
Lathrop**	67	31	47.7	3.80	Redlands a	66	27	44.4	5.56
Laurel**	67	29	45.7	11.33	Redlands b**	66	27	44.4	5.56
Lemoore a**	72	28	45.0	0.43	Redlands c**	67	31	46.7	0.90
Lemoore b	70	27	45.0	0.41	Reprea	73	31	49.2	5.53
Lick Observatory †	54	16	35.6	10.52	Rio Vista	68	29	48.0	4.56
Lime Point L. H.	54	16	35.6	10.52	Riverside †	76	26	48.4	0.35
Little Bear Valley	54	16	35.6	10.52	Rocklin**	73	34	51.3	6.01
Little Bear Valley (near)	54	16	35.6	10.52	Roe Island L. H.	68	16	41.8	0.23
Livermore**	65	30	49.0	5.36	Rosamond*†1	66	24	43.7	3.90
Livingston**	70	32	49.7	2.95	Sacramento a	77	35	49.3	3.47
Lodi	65	30	46.8	6.75	Sacramento b**	62	36	47.7	3.62
Long Beach**	72	32	49.9	6.75	Salinas**	62	34	49.6	3.30
Los Angeles**	70	32	49.6	6.78	Salton**	90	28	54.6	0.00
Los Banos**	58	30	46.1	1.50	San Ardo a**	70	25	46.9	0.34
Los Gatos a**	74	31	49.4	4.35	San Bernardino †	74	26	47.8	0.88
Los Gatos b	64	29	45.2	5.22	San Gabriel**	73	32	48.2	0.48
Lower Holcomb Valley	64	29	45.2	5.22	Sanger Junction**	75	32	50.9	2.46
Manzanita*1	65	19	39.2	0.37	San Jacinto †	78	22	47.2	0.96
Mammoth Tank**	82	33	52.6	0.00	San Jose a**	65	35	48.6	2.61
Mare Island L. H.	64	22	41.2	2.72	San Jose b	64	24	45.7	2.35
Mariposa*1	64	22	41.2	2.72	San Luis L. H.	64	24	45.7	2.35
Martinez**	60	32	45.2	3.07	San Luis Obispo	63	36	49.9	6.62
Marysville a**	65	35	44.9	1.74	San Mateo**	69	27	46.9	0.41
Mendota**	62	28	44.1	0.86	San Miguel**	79	42	54.2	0.75
Menlo Park**	62	33	47.7	2.80	San Pedro**	68	30	46.6	5.46
Merced**	67	32	46.0	3.28	San Rafael †	78	37	55.8	0.50
Middletown*†1	75	26	44.6	8.32	Santa Ana*2	65	40	49.8	0.50
Mills College	64	28	45.3	4.15	Santa Barbara b**	65	40	49.8	0.50
Milton**	65	30	46.3	7.05	Santa Barbara L. H.	66	32	48.6	2.16
Milton (near)*1	65	30	46.3	7.05	Santa Clara b	70	32	52.0	1.85
Modesto**	78	32	48.0	3.18	Santa Cruz a**	69	36	49.7	7.77
Mokelumne Hill**	70	26	42.5	0.54	Santa Cruz b †	70	32	49.4	8.60
Monson**	68	34	48.0	1.14	Santa Cruz L. H.	70	26	42.5	7.17
Montague**	58	10	36.5	2.13	Santa Margarita**	65	24	44.7	3.21
Monterey	66	30	47.7	2.05	Santa Maria	72	32	48.6	1.78
Monterey (Hotel del Monte)*1	69	34	49.7	3.93	Santa Monica**	68	32	47.4	0.55
Morses House	68	32	47.7	4.08	Santa Paula**	68	34	48.3	0.00
Mountain View	68	32	47.7	4.08	Santa Rosa**	67	33	48.7	3.78
Mount Glenwood*1	69	31	45.2	4.89	Saticoy †	70	32	48.5	1.21
Napa a**	67	32	48.2	2.97	Seima**	57	11	33.2	6.44
Napa b	67	32	48.2	2.97	Shasta Springs †	65	23	42.9	9.40
					Sims**	63	16	36.2	4.40
					Sisson**	53	4	32.7	2.60

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>California—Cont'd.</i>	°	°	°	Ins.	<i>Colorado—Cont'd.</i>	°	°	°	Ins.
Sneddens Ranch	72	28	47.5	0.65	Moraine†	41	-16	18.9	0.07
Soledad**	68	31	44.9	3.95	Pagoda (near)†	41	-22	11.7	3.00
Sonoma**	68	31	44.9	3.95	Paonia†	50	11	29.0	0.65
S. E. Farrall L. H.	68	36	48.2	1.98	Parachute†	50	11	29.0	0.65
South Vallejo**	68	36	48.2	1.98	Rico	60	-6	28.7	1.20
Squadra**	81	39	51.3	0.09	River Bend**	59	-13	24.5	0.95
Squirrel Inn	65	31	46.2	4.93	Saint Cloud	51	-29	21.0	1.10
Stockton**	65	33	50.4	5.44	Sanborn	51	-29	21.0	1.10
Stockton b**	65	33	50.4	5.44	Seibers†	59	-15	23.7	1.00
Suisun City**	70	34	48.7	2.29	Smoky Hill Mine†	59	-15	23.7	1.00
Summit**	38	5	23.9	0.00	Springfield†	59	-15	23.7	1.00
Susanville**†	53	3	30.0	3.53	Stamford**	59	-15	23.7	1.00
Sutter Creek**	60	23	38.0	7.70	Steamboat Spring†	59	-15	23.7	1.00
Tehachapi**	55	18	35.2	1.68	Surface Creek†	59	-15	23.7	1.00
Tehachapi b†	64	11	32.2	1.11	Thon†	60	-11	25.4	0.07
Tehama**	70	32	49.4	1.82	T. S. Ranch†	49	1	25.2	1.03
Templeton**	75	28	47.3	0.87	Twin Lakes	49	1	25.2	1.03
Towles**	63	14	36.7	10.10	Vilas	49	1	25.2	1.03
Tracy**	66	29	47.1	2.09	Walton†	49	1	25.2	1.03
Traver**	65	44	51.6	1.05	Ward District	49	1	25.2	1.03
Trinidad L. H.	73	34	48.2	0.73	Watkins**	50	0	24.1	0.90
Tropico**	45	-5	23.7	10.95	Yuma	50	0	24.1	0.90
Truckee**	72	30	49.4	0.37	Zuck	50	0	24.1	0.90
Tulare**	82	26	49.8	0.38	<i>Connecticut.</i>				
Tulare c	82	26	49.8	0.38	Bridgeport**	48	-2	26.3	4.57
Tunnel No. 2	70	32	48.8	2.37	Canton	50	-16	23.4	3.58
Turlock a**	68	27	46.4	2.17	Colchester	50	-7	24.8	3.20
Turlock b†	66	26	43.5	9.41	Falls Village	50	-7	24.8	3.20
Ukiah†	68	25	42.3	6.21	Greenfield Hill	50	-7	24.8	3.20
Upper Lake	71	28	44.6	11.97	Hartford b	50	-7	24.8	3.20
Upper Mattole**	73	33	47.6	4.50	Hartford c	50	-7	24.8	3.20
Vacaville a†	71	33	47.6	4.50	Lake Konomoc	50	-7	24.8	3.20
Vacaville b**	73	33	47.6	4.50	Lebanon	50	-7	24.8	3.20
Valley Springs**	69	34	49.5	5.86	Middleton	50	-7	24.8	3.20
Ventura†	69	30	50.3	0.50	New Hartford a†	50	-7	24.8	3.20
Vina**	67	37	48.1	2.51	New Hartford b	50	-7	24.8	3.20
Volcano Springs**	90	33	55.3	0.00	N. Grosvenor Dale	50	-12	25.3	2.48
Walnut Creek	70	30	46.3	3.79	Norwalk	50	-6	24.3	3.85
Weaverville†	82	10	44.4	5.02	Southampton**	48	-8	24.3	3.85
West Butte	64	29	46.5	1.10	South Manchester	47	-12	22.5	3.13
Westley**	68	33	48.7	1.78	Storrs	47	-12	22.5	3.13
West Point	70	31	46.4	3.82	Thompson**	44	-10	22.2	3.72
Wheatland	78	40	57.6	0.55	Voluntown†	50	-16	25.1	3.72
Whittier**	68	30	47.4	1.07	Wallingford†	49	-8	24.8	2.62
Williams a†	62	29	41.9	1.12	Waterbury	49	-8	24.8	2.62
Williams b**	65	30	44.7	0.95	West Simsbury	49	-8	24.8	2.62
Winchester†	79	21	47.6	0.32	<i>Delaware.</i>				
Winters**	69	34	48.9	3.53	Dover†	60	9	34.8	4.81
Wire Bridge**	68	28	46.7	9.07	Kirkwood**	60	9	34.8	4.81
Woodland**	68	31	46.1	2.00	Milford	62	10	35.6	5.09
Yerba Buena L. H.	61	1	32.9	3.22	Millsboro	68	12	36.6	4.95
Yreka†	67	38	49.2	2.32	Seaford†	67	10	36.6	4.60
Yuba City**	67	38	49.2	2.32	<i>District of Columbia.</i>				
<i>Colorado.</i>					Dist'ng Reserv'r**	58	14	35.2	4.02
Abbott	69	-16	26.4	1.10	Reeing Reserv'r**	58	15	35.0	3.33
Akron†	37	-17	11.8	0.95	West Washington	68	14	37.8	4.35
Alma†	37	-17	11.8	0.95	<i>Florida.</i>				
Amherst†	37	-17	11.8	0.95	Amelia†	76	34	57.0	4.70
Arboles	37	-17	11.8	0.95	Archer†	85	32	61.7	4.88
Avoca	37	-17	11.8	0.95	Brooksville†	80	33	61.8	3.42
Boulder†	56†	-81	27.6†	0.82	Brush†	83	37	64.0	1.82
Breckenridge†	41	-25	9.8	7.77	De Land†	83	35	62.7	0.98
Brush†	60†	-15	17.6†	0.34	Eustis†	84	35	64.2	0.98
Byers**	52	2	21.8	0.63	Federal Point†	82	34	60.9	2.16
Canyon†	58	-13	26.6	0.63	Fort Meade†	83	37	63.7	3.16
Castle Rock†	54	-14	22.4	1.05	Grasmere†	83	34	64.1	1.13
Cheyenne Wells**†	50	-5	19.3	1.30	Green Cove Sp'gs†	79	33	57.7	1.88
Climax**†	31	-12	7.0	4.70	Homeland†	64	34	64.0	1.79
Collbran	1.82				Kissimmee†	85	36	66.8	1.40
Como (near)†	35	-9	14.5	0.58	Lake City†	77	34	61.8	6.45
Cope†	57	-11	23.0	0.80	Manatee†	82	35	63.4	1.42
Deer Trail**	54	-5	24.4	0.50	Merritts Island†	82	46	65.1	0.21
Delta†	56	-14	24.2	0.90	Moseley Hall†	75	28	56.8	9.00
Divide Ex. Station	50	-17	18.4	1.11	Mullet Key†	75	40	63.2	1.88
Downing†	65	-10	24.2	1.17	Myers†	84	42	66.3	1.55
Dumont	45	-13	21.6	0.90	New Smyrna†	83	35	62.4	0.60
East Dale	56	-22.5	0.85		Oak Hill**	80	39	67.6	0.60
First View**	56	-22.5	0.85		Ocala**†	84	32	62.0	1.43
Fort Collins†	55	-15	18.7	0.60	Orange City†	86	33	62.8	0.48
Garnett	55	-15	18.7	0.60	Orange Park	80	32	58.4	3.34
Glen Eyrie†	52	-6	24.0	0.39	Orlando†	86	36	64.8	0.98
Glenwood Sp'gs†	52	-2	27.4	0.87	Oxford**†	80	34	59.7	1.83
Gold Hill	50	-6	25.3	0.88	Plant City†	86	33	65.4	1.98
Grand Junction†	52	-12	29.8	0.47	Saint Francis B'ks	81	31	59.0	1.61
Greeley†	64	-13	19.5	0.40	Saint Petersburg†	82	38	65.0	1.90
Gunnison†	42	-34	4.2	2.10	Tallahassee†	77	28	54.3	11.19
Hugo**	60	-4	24.5	0.50	Tarpon Springs†	85	36	64.2	1.92
Hugo (near)†	58	-14	20.6	0.29	<i>Georgia.</i>				
Husted†	58	-9	24.2	0.39	Adairsville†	74	20	43.9	4.91
Idaho Springs†	47	-12	21.2	0.52	Blakely**†	75	28	53.4	0.89
Kirk	60	-6	22.0	0.52	Bragt†	78	25	54.8	4.43
Kit Carson**	60	-6	22.0	0.52	Camilla	77	20	53.4	0.90
La Jara†	55	-9	21.9	1.33	Clayton†	71	17	42.8	6.53
Las Animas†	58	-18	17.8	1.10	Cobutta	70	20	45.1	3.88
Lay**†	46	-22	11.0	1.29	Covington	70	20	45.3	5.77
Le Roy**†	50	-12	20.1	0.46	Dahlonega†	70	17	45.3	7.26
Lealie	50	-12	20.1	0.46	Darien†	81	30	57.0	4.50
Loveland	50	-12	20.1	0.46	Diamond†	75	25	53.6	8.01
McCoy†	50	-12	20.1	0.46	Dublin a†	72	20	45.8	5.38
Manhattan	50	-12	20.1	0.46	Elberton†	72	20	45.8	5.38
Meeker†	54	-21	16.2	1.45	Fleming†	78	24	53.8	4.63
Minneapolis†	62	-11	23.8	1.30					
Monte Vista b	52	-15	17.6	0.98					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Georgia—Cont'd.</i>					<i>Indiana—Cont'd.</i>				
Forsyth* ¹	78	26	52.3	9.69	Butlerville†	64	9	31.8	5.00
Gillsville*† ¹	70	20	44.9	5.23	Cambridge City†	60	3	31.7	3.67
Hawkinsville†	75	22	52.6	9.11	Columbia City* ¹	54	0	23.9	2.79
Hephzibah*† ³	67	24	50.0	5.90	Columbus	64	6	31.9	4.11
Lafayette†	70	20	43.5	5.24	Connersville†	62	5	29.6	4.14
Lagrange	72	20	46.8	8.01	Degonia Springs**	62	6	35.2	4.24
Lawrenceville†	68	13	39.4	3.45	Delphi	54	1	25.0	2.99
Leverett	79	21	44.0	4.39	Evansville†	60	5	28.7	4.80
Louisville†	74	22	49.3	6.91	Farmland†	60	5	28.7	3.05
Lumpkin†	70	24	50.2	9.05	Franklin* ¹	62	3	29.2	3.20
McArthur†	74	27	52.2	6.13	Hammond†	49	-9	25.1	1.89
Marietta†	71	19	43.2	6.65	Hawpach†	46	7	23.1	2.93
Marshallville†	72	25	50.2	10.41	Huntingburg*† ¹	60	17	34.5	5.80
Monticello*† ¹	68	23	45.0	5.56	Huntington	59	0	26.6	3.20
Morgan†	76	24	51.4	10.06	Jasper†	62	5	33.4	4.01
Piscola	75	30	56.1	8.50	Jeffersonville	66	15	35.7	5.51
Pont Peter* ¹	64	20	45.4	4.85	Kokomo†	53	2	26.4	2.98
Poulan†	79	23	52.4	9.07	Laconia	63	6	33.5	4.88
Rome†	74	22	44.6	4.92	Lafayette†	59	-7	25.0	2.61
Talbotton†	71	20	48.5	7.54	Logansport†	62	3	33.2	2.67
Toccoa†	76	20	47.7	5.57	Logansport b	58	-3	25.6	1.95
Washington†	70	21	48.2	3.70	Madison†	66	9	34.4	4.37
<i>Iaho.</i>					<i>Marengo*¹</i>				
American Falls†	40	-21	16.8	1.19	Marion†	61	2	26.9	3.62
Atlanta†	29	1	16.9	3.60	Markle†	59	-3	25.3	3.56
Boise Barracks	50	4	28.9	0.82	Mauzy	61	0	27.8	4.05
Chesterfield†	50	-11	15.2	0.39	Mount Vernon†	62	7	32.2	4.59
Egint†	36	-20	10.4	0.95	Muncie†	62	8	31.4	4.77
Fort Lemhi†	50	-16	15.2	0.56	New Albany*† ¹	57	10	34.6	5.00
Fort Sherman†	40	-15	12.5	4.00	Princeton*† ¹	63	5	32.6	4.20
Garden Valley*† ¹	36	-14	18.1	3.20	Rockville†	61	-3	27.0	2.95
Grangeville	46	-2	24.4	1.37	Rushville†	61	-3	27.0	2.95
Hailey*†	40	-10	13.0	3.95	Seymour†	67	7	30.4	5.02
Idaho City†	49	-11	18.8	3.35	Shelbyville†	63	6	29.5	4.08
Kootenai†	47	-6	22.5	3.47	South Bend†	54	0	23.8	2.44
Lake†	44	-24	9.6	0.85	Terre Haute†	62	7	30.7	2.73
Lewiston†	58	5	32.0	0.47	Union City†	62	-1	28.7	3.56
Martin†	46	-10	12.5	1.75	Valparaiso†	45	-10	19.8	1.90
Moscow†	45	-8	25.7	3.10	Veedsburg†	58	-2	24.6	2.35
Murray†	41	-20	23.2	3.14	Vevay	66	10	33.5	3.13
Nampa	51	-7	26.8	0.87	Worthington†	64	4	32.2	3.34
Oakley†	47	-9	24.4	0.70	<i>Indian Territory.</i>				
Paris†	54	-31	14.8	1.09	Eufaula†	44	-21	16.2	0.15
Payette†	51	-2	20.7	1.79	Gwendale†	40	-	-	0.32
Safubria†	51	-12	22.6	2.04	Headton†	40	-	-	0.80
Soldier†	44	-26	14.0	3.25	Kemp†	75	15	42.0	3.73
<i>Illinois.</i>					Lehigh†	72	12	40.1	2.75
Albion†	63	4	22.1	3.35	Parcell†	69	-2	36.7	1.09
Aurora†	50	-12	21.6	1.95	South McAlester†	40	-	-	4.65
Beardstown†	51	-	-	1.52	Tulsa†	40	-	-	1.00
Bloomington†	51	-2	24.6	1.93	<i>Iowa.</i>				
Braidwood†	52	-6	24.7	1.31	Algona* ¹	44	-21	16.2	0.15
Bushnell†	53	2	25.2	1.40	Alta†	45	-16	16.2	0.30
Carlinville†	57	6	28.0	2.77	Amana†	49	-10	19.3	1.56
Carlyle	57	-	-	2.17	Ames b	50	-16	16.8	1.00
Carrollton a	57	7	29.1	...	Ames c	50	-	-	0.53
Chemung	49	-11	18.2	...	Atlantic†	53	-19	19.0	1.15
Decatur†	57	1	27.4	2.39	Audubon	49	-14	17.8	0.85
Dixon†	47	-12	20.0	1.97	Belle Plaine	51	-12	19.4	0.85
East Peoria†	57	-2	25.9	1.06	Bonaparte†	56	-1	23.3	0.40
Effingham†	62	12	31.3	0.30	Carroll†	52	-14	16.6	1.00
Fort Sheridan†	48	-8	19.7	1.45	Cedar Falls†	53	-10	18.9	0.50
Galva†	53	-6	22.4	0.88	Cedar Rapids†	50	-6	20.9	1.58
Golconda†	64	14	36.8	4.60	Charles City†	55	-12	15.9	1.10
Greenville†	62	7	30.8	2.45	Clarinda†	51	-4	21.3	1.40
Griggsville†	55	5	27.2	2.30	Clinton	47	-10	20.8	1.91
Halliday* ²	60 a	13 a	31.6 a	3.01	College Springs	56	-6	22.3	1.17
Havana†	56	3	29.2	2.32	Corning†	53	-7	22.0	1.72
Jordans Grove†	64	8	33.8	2.60	Cresco†	46	-13	15.4	0.47
Kankakee*†	48	-6	16.7	1.67	Decorah†	48	-14	16.8	0.35
Lagrange†	48	-9	22.6	1.72	Delaware* ²	52	-11	15.8	0.57
Louisville†	62	4	31.5	2.43	Elkader†	52	-13	18.2	0.93
McLeansboro* ¹	64	8	33.5	2.88	Fairfield†	54	0	22.8	1.08
Martinsville†	59	5	28.8	2.83	Fayette†	48	-15	17.6	0.35
Mascoutah* ²	60	6	29.0	2.21	Fort Madison*† ¹	52	5	27.8	1.05
Mattson* ¹	59	12	32.5	1.46	Galva†	44	-15	16.1	0.66
Monmouth†	54	-1	24.3	1.35	Glenwood†	60	5	23.4	1.30
Mount Carmel†	61	0	27.4	2.62	Grand Meadow* ¹	47	-8	19.1	0.58
Mount Pulaski	61	0	27.4	2.62	Greenfield†	50	-12	19.8	1.03
Olney a* ¹	58	4	32.5	3.19	Grinnell†	50	-8	21.6	0.45
Olney b* ¹	58	3	32.4	3.74	Grundy Center	51	-12	17.1	0.49
Oregon†	48	-3	22.6	0.88	Hampton	45	-13	16.8	0.86
Oswego* ¹	47	-14	19.6	1.10	Hawkeye	51	-	-	1.08
Ottawa†	51	-7	22.6	1.58	Hopeville†	53	-5	20.5	1.23
Palestine†	65	4	30.6	5.01	Hopkinton* ²	48	-7	21.2	0.60
Paris†	60	1	27.7	2.64	Humboldt†	40	-	-	0.40
Peoria a†	54	5	26.4	1.48	Independence†	49	-13	18.2	0.90
Peoria b	54	-5	25.5	3.28	Indiana†	53	-9	22.6	0.77
Philo†	58	-	-	1.04	Lowa City†	54	-10	22.5	1.64
Quincy†	52	-2	24.8	1.77	Iowa Falls†	46	-17	15.8	0.20
Rantoul*† ²	48	-10	18.6	1.33	Keosauqua†	58	2	25.5	1.47
Riley†	46	-6	19.5	2.06	Knoxville	53	-7	20.1	1.20
Rockford* ¹	55	4	26.2	2.40	Larabee†	44	-13	15.9	0.26
Rushville	55	4	26.2	2.40	Le Claire†	50	-15	20.2	0.70
Saint John* ²	54	-2	26.3	0.44	Maxon* ¹	56	5	18.4	1.28
Streator†	47	-10	21.2	1.35	Mechanicsville	47	-9	18.4	1.47
Sycamore* ¹	57	1	25.5	1.05	Monticello*† ¹	45	-10	17.4	0.81
Tuscola*† ¹	57	-8	23.3	2.10	Mount Pleasant* ²	49	-	-	0.50
Warsaw†	61	0	27.4	2.62	Mount Vernon* ¹	44	-10	19.4	...
Winnebago†	45	-9	19.0	1.25	Muscataine†	56	-6	21.7	1.23
<i>Indiana.</i>					Newton	51	-11	19.2	0.56
Angola* ¹	54	-6	24.2	2.17	Osage*† ²	51	-	-	0.50
Ashboro†	60	3	29.9	3.18	Oskaloosa†	55	-6	22.8	1.12
Bedford†	55	9	29.0	3.60	Ottumwa	59	-1	24.7	0.80

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i> Iowa—Cont'd.</i>					<i> Kentucky—Cont'd.</i>				
Ovid f.	61	-2	22.8	1.96	Lagrange f.	60	7	32.2	1.34
Panama f.	46	-12	17.8	0.31	Louisia f.	60	7	32.2	1.34
Richland f.	54	-7	20.1	1.47	Middlesboro f.	66	9	34.2	4.21
Rock Rapids.	46	-14	14.5	T.	Mount Sterling f.	66	9	34.2	4.21
Rockwell City.	45	-12	17.0	0.22	Munfordville f.	65	15	38.2	5.93
Sac City f.	47	-10	17.0	0.55	Paducah f.	65	18	36.9	5.93
Seymour f.	45	-12	24.6	2.41	Pellville f.	65	18	36.9	5.93
Sibley.	42	-13	13.4	T.	Princeton f.	65	18	36.9	5.93
Spirit Lake f.	45	-13	15.0	0.10	Russellville f.	70	13	38.0	7.99
Tipton f.	49	-11	21.2	1.86	Sandy Hook f.	69	10	37.2	3.11
Toledo f.	50	-11	30.5	0.60	Shelby City f.	66	10	35.6	4.07
Villisca f.	54	-5	21.2	1.42	Shelbyville f.	67	8	34.7	4.58
Vinton f.	51	-9	19.7	0.80	South Fork f.	67	10	36.7	4.04
Washington f.	58	-3	22.6	1.25	Williamsburg f.	67	10	36.7	4.04
Webster City f.	48	-12	17.0	0.75	<i> Louisiana.</i>				
West Bend f.	44	-12	14.1	0.60	Abbeville.	84	25	53.4	9.47
Williams f.	46	-16	16.3	0.33	Alexandria f.	70	19	44.3	6.05
Winters f.	50	-9	21.3	1.30	Amite f.	84	22	51.0	7.05
<i> Kansas.</i>					Bastrop f.	77	22	47.0	2.94
Abilene f.	66	-2	28.3	1.15	Baton Rouge f.	75	27	52.8	8.73
Achilles f.	55	-10	12.4	1.11	Calhoun f.	76	22	44.8	4.62
Allison f.	56	-10	17.0	1.24	Cameron f.	76	22	44.8	4.62
Altova f.	58	-1	27.2	1.05	Cheneyville f.	75	25	55.8	6.62
Atchison f.	56	0	26.2	0.92	Clinton f.	75	25	55.8	6.62
Bucklin.	58	-8	26.6	1.94	Coushatta f.	80	22	48.6	4.21
Burlington f.	58	-15	21.3	0.90	Coushatta f.	80	22	48.6	4.21
Colby f.	56	-15	21.3	0.90	Covington f.	78	18	44.4	4.56
Coldwater f.	79	-4	31.0	0.70	Davis f.	78	18	44.4	4.56
Columbus f.	58	-1	30.4	1.04	Delhi f.	78	18	44.4	4.56
Coolidge f.	57	-13	23.0	0.50	Donaldsonville f.	82	29	58.0	10.15
Cunningham f.	62	-2	27.3	0.95	Emile f.	77	29	54.1	12.03
Downs.	57	-5	30.0	0.10	Farmerville.	74	22	45.8	4.85
Eldorado f.	63	1	30.9	1.27	Franklin f.	76	27	55.4	8.09
Elk City f.	60	0	28.6	1.95	Girard f.	75	24	45.0	2.97
Emporia f.	60	0	28.6	1.95	Grand Coteau.	82	29	54.2	6.05
Englewood f.	64	-6	26.8	0.50	Hammond f.	80	24	53.1	7.89
Eureka Ranch f.	57	-11	20.6	2.52	Houma f.	80	29	57.2	10.39
Fort Riley f.	63	-3	23.6	0.54	Jeanerette f.	80	27	54.8	10.33
Garden City f.	60	-6	22.0	0.55	Lafayette f.	81	26	54.9	5.84
Garfield.	62	2	23.7	1.27	Lake Charles f.	86	20	50.0	6.60
Gove f.	62	2	23.7	1.27	Lake Providence f.	74	21	45.4	4.07
Grenola f.	61	6	29.5	1.20	Lawrence f.	78	20	52.7	8.15
Grinnell f.	60	0	29.4	0.87	Liberty Hill.	82	21	44.3	3.85
Halstead f.	62	-2	27.7	0.88	Maurepas.	84	23	53.7	7.57
Hays City f.	62	-12	23.8	0.95	Meville f.	80	34	58.4	7.24
Horton f.	60	-1	25.8	1.00	Minden f.	78	22	47.4	2.92
Hutchinson f.	72	-3	39.8	1.20	Monroe f.	76	28	48.6	3.20
Independence f.	60	-2	30.6	2.12	Natchitoches f.	86	22	49.0	5.34
Ionia f.	64	-12	21.5	0.70	New Iberia.	76	29	52.0	9.27
Johnson f.	63	-11	22.6	1.08	Opelousas f.	87	26	53.8	8.48
Kiowa f.	62	2	29.6	0.30	Oxford.	81	20	46.4	4.92
Lakin f.	57	-16	24.4	1.20	Paincourtville f.	81	27	54.4	10.26
Lawrence f.	58	-2	28.0	2.75	Plain Dealing.	73	21	45.8	3.11
Lebo f.	62	4	28.1	2.82	Rayne f.	83	22	52.4	8.22
Leoti f.	56	-12	20.6	2.10	Roseland.	83	22	52.4	8.22
Macksville f.	61	-5	25.3	0.48	St. Joseph f.	78	27	47.4	4.83
McPherson f.	60	-2	23.9	0.40	St. Joseph f.	78	27	47.4	4.83
Manhattan f.	67	-11	26.2	1.10	Schriever f.	79	26	55.2	9.03
Manhattan f.	67	-6	23.7	1.50	Shell Beach.	74	32	54.4	6.85
Marion f.	60	-3	25.8	1.82	Sugar Ex. Station f.	80	29	53.2	13.43
Marmaton.	60	-3	25.8	1.82	Sugartown f.	78	17	46.6	8.07
Medicine Lodge.	61	-8	23.4	0.47	Thibodeaux.	78	17	46.6	8.07
Minneapolis f.	61	-8	23.4	0.47	Wallace.	81	30	54.4	11.25
Morland f.	63	-15	21.2	1.45	West End.	81	30	54.4	11.25
Morton f.	58	-9	25.1	1.00	Winnfield f.	80	23	48.5	6.01
Mount Hope f.	60	-2	28.2	1.40	<i> Maine.</i>				
Mount Hope f.	60	-2	28.2	1.40	Bar Harbor.	44	-14	21.2	1.47
Norton f.	61	-13	22.7	1.20	Belfast f.	41	-15	17.9	3.65
Oberlin f.	61	-4	28.9	2.33	Calais f.	45	-14	18.8	1.55
Olathe f.	61	-4	28.9	2.33	Cornish f.	47	-18	18.8	2.51
Oswego f.	65	-8	29.1	1.10	East Machias f.	43	-17	16.8	1.32
Phillipsburg f.	58	-10	19.6	1.40	Fairfield.	46	-31	13.0	1.03
Pleasant Dale f.	59	-9	22.9	1.30	Farmington f.	48	-31	15.2	2.22
Quinter f.	56	-9	19.2	1.20	Fort Kent f.	41	-31	9.9	0.50
Rome f.	57	-10	20.5	0.97	Gardiner.	47	-23	16.0	1.99
Sedan f.	61	-1	30.4	1.22	Houlton f.	46	-37	9.4	1.75
Sharon Springs f.	64	-4	26.6	0.95	Indian Stream.	44	-28	8.6	1.61
Sterling f.	60	-1	28.2	1.35	Kents Hill.	46	-22	13.2	1.32
Topeka f.	67	-2	28.4	1.25	Lewiston.	48	-20	16.0	2.26
Tribune f.	56	-10	21.4	1.50	Madison f.	40	-34	15.6	2.25
Ulysses f.	56	-8	22.1	0.97	Mattawamkeag.	43	-39	7.9	2.24
Wakefield f.	62	-2	27.0	0.34	North Bridgeton.	44	-26	15.4	2.24
Wallace f.	62	-2	27.0	0.34	Orono f.	42	-30	16.0	1.73
Wamego f.	62	-2	25.6	1.09	Petit Menan f.	36	-12	21.3	1.87
Yates Center f.	59	.....	.....	1.90	West Jonesport f.	38	-16	19.2	.....
<i> Kentucky.</i>					<i> Maryland.</i>				
Alpha f.	72	18	43.9	3.29	Bachmans Val. f.	52	3	27.8	3.10
Bowling Green f.	67	11	35.5	6.99	Benedict f.	67	15	36.6	3.38
Bowling Green f.	74	14	36.5	6.37	Boettcheville f.	58	2	30.1	4.50
Caddo f.	61	11	39.7	5.45	Cambridge.	64	14	37.8	5.70
Canton f.	66	16	37.7	3.54	Charlotte Hall f.	68	15	36.0	3.46
Carrollton f.	67	10	33.9	3.82	Chestertown f.	59	9	33.2	2.55
Catlettsburg f.	64	18	36.8	1.90	College Park.	59	14	35.0	3.80
Earlington.	67	11	36.4	6.84	Cumberland a f.	52	6	31.2	3.76
Eddyville f.	66	9	37.3	6.24	Cumberland b.	52	6	35.9	4.14
Edmonton f.	66	9	37.3	6.24	Denton f.	52	9	33.0	5.11
Elizabethtown f.	61	2	34.8	4.48	Easton f.	63	14	37.0	4.09
Eubank f.	79	6	36.2	4.47	Fallston f.	54	6	32.0	4.30
Falmouth f.	65	12	36.4	4.72	Fenby f.	50	4	30.4	3.90
Ford f.	65	12	36.4	4.72	Great Falls f.	56	14	34.6	3.28
Franklin f.	68	15	37.7	6.00	McDonogh f.	54	8	33.6	.....
Greendale f.	66	9	35.0	3.68	Mardela Springs f.	66	12	36.6	3.86
Greensburg f.	66	14	36.5	5.14	Mt. St. Marys Col. f.	55	3	29.4	3.26
Harrodsburg f.	69	5	36.3	4.12	New Market f.	53	10	31.4	2.43
Henderson f.	69	11	37.8	4.21					
Hendricks f.	69	11	37.8	4.21					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Maryland—Cont'd.</i>					<i>Michigan—Cont'd.</i>				
Oakland *†	52	-10	27.8	5.83	Bronson	50	-13	22.2	1.80
Solomons †	67	15	37.7	3.91	Brown City	47	-11	21.4	5.10
Sunnyside	56	-3	27.6	6.15	Calumet	40	-16	13.3	0.36
Taneytown †				4.20	Charlevoix	53	-14	18.1	0.65
Upper Marlboro †	62	13	35.1		Cheboygan	50	-22	14.2	1.02
Valley Lee ‡			37.4	4.00	Clinton	55	-10	23.2	1.60
Woodstock	55	7	32.4	2.31	Crystal Falls	46	-25	15.2	0.70
<i>Massachusetts.</i>					Fairview	50	2	22.2	2.94
Adams	50	2	24.4		Fitchburg	48	-18	20.7	3.36
Amherst	51	-15	22.6	1.92	Flint	49	-16	20.1	1.79
Amherst Ex. St'n a.	46	-18	19.8	2.16	Frankfort *†‡	50	0	26.5	
Amherst Ex. St'n b.	49	-17	21.6	1.74	Grande Pointe au				
Andover	48	-13	24.5	2.93	Sable *†‡	42	-3	23.0	
Ashland				3.91	Grand Rapids	49	-6	24.4	1.65
Bedford	51	-13	23.5	2.61	Grape	56	-8	24.6	1.67
Beverly Farms	49	-11	24.1	4.15	Grayling	45	-31	15.8	1.20
Blue Hill (sum't)	47	-11	23.3	3.53	Hammonds Bay *†‡	54	-15	19.7	
Blue Hill (valley)	49	-16	23.6	3.78	Hanover	53	-9	25.0	3.20
Boston				3.28	Harbor Springs	53	-26	10.7	1.30
Brookton a.	50	-7	25.2	2.88	Harrison	49	-22	19.7	0.97
Brookton b.				3.00	Harrisville	46	-15	18.6	2.16
Cambridge a.	51	-8	25.4	3.39	Hart	50	-5	25.6	1.00
Cambridge b.	49	-7	24.9	2.91	Hastings	49	-6	23.4	2.31
Chestnut Hill	52	-10	25.9	3.81	Hayes	45	-8	21.3	1.22
Clinton				1.95	Howell	50	-17	21.5	2.39
Concord †	51	-20	21.8	2.69	Jeddo	45	-11	21.0	2.51
Dudley	47	-13	22.2	3.52	Kalamazoo	50	-6	23.4	0.98
East Templeton †	46	-14	20.4	3.60	Lansing	50	-9	21.1	1.67
Egg Rock, Nahant.	46	-8	27.4		Lathrop †	44	-28	11.7	0.62
Fall River †	48	-5	27.7	4.89	Lewiston	48	-19	18.4	0.36
Fiskdale				1.89	Lodi	46	-23	18.4	1.11
Fitchburg a †	46	-13	22.2	3.63	Ludington †‡	50	0	25.6	
Fitchburg b	47	-12	21.4	2.48	Madison	54	-8	23.1	2.52
Frammingham	49	-14	24.2	3.91	Manistee b *†‡	40	-6	19.1	
Gilbertville	48	-16	23.0	3.55	Mayville	49	-13	20.5	1.33
Great Barrington	47	-14	21.4		Mio	47	-20	18.0	
Groton a	48	-17	21.2	2.77	Mottville	55	-8	22.4	1.55
Hingham				3.54	N. Maniton Isl'd †‡	44	-6	21.9	
Hyannis	47	-2	29.2	3.81	North Marshall	49	-12	19.8	1.43
Kendall Green	50	-14	23.6	4.35	Old Mission ‡	45	-12	18.2	0.36
Lake Cochituate	54	-23	23.3	3.89	Olivet	50	-13	21.3	1.36
Lawrence	49	-12	22.2	3.10	Ovid	45	-12	21.0	1.67
Leeds	50	-24	20.1	3.97	Paris	45	-21	19.6	2.57
Leicester	46	-15	21.7		Parkville				2.12
Leominster †	48	-12	23.8	2.84	Point Betsey †‡	48	-2	23.8	
Long Plain †‡	44	-15	25.1	5.10	Rawsonville †	50	0	23.8	2.20
Lowell a	48	-18	22.6	3.50	Saint Ignace	43	-25	14.2	0.97
Lowell b	51	-17	22.5		Sand Beach	47	-9	21.7	
Lowell c	53	-11	26.8		Stanton	47	-13	20.4	2.00
Mudlow Center	47	-16	20.3	2.37	Thornville	48	-13	22.6	1.31
Lynn a	54	-7	27.8	2.74	Vandalia	51	-5	22.8	1.61
Lynn b	46	-7	25.0		Williamston †	54	-14	25.8	2.60
Mansfield †	48	-19	24.5	4.61	Ypsilanti	54	-12	22.3	2.88
Medford				3.01	<i>Minnesota.</i>				
Middleboro	48	-12	25.7	4.74	Adat †	47	-20	13.0	0.35
Milton †	50	-7	26.8	3.72	Airlie †	41	-17	12.4	T.
Monroe	46	-25	16.9	2.71	Albert Lea †	41	-15	13.8	0.10
Monson	51	-18	22.9	3.03	Alexandria a †				0.01
Mount Nonotuck				2.70	Alexandria b	38	-20	9.1	0.02
Mystic Lake				3.31	Barrett †	40	-15	13.0	0.01
Mystic Station				3.09	Bearsley †	47	-16	14.8	0.13
New Bedford a †	47	-5	25.8	5.18	Belle Plaine †	40	-12	15.4	0.60
New Bedford b	48	-9	26.2	4.49	Bingham Lake †	38	-14	14.4	T.
North Billerica	52	-9	23.4	3.05	Bird Island	39	-13	13.9	T.
Plymouth †	50	-3	28.8	4.85	Blooming Prairie †	42	-15	13.5	0.20
Provincetown	44	-1	27.9	2.67	Bonniwells Mills †	45	-11	15.8	
Randolph				3.63	Condonia †	46	-13	15.7	1.02
Roberts Dam				3.46	Cambridge †	40	-23	10.8	T.
Roxbury	49	-6	26.2	3.44	Cambert †	43	-13	14.8	0.02
Royalston †	46	-12	20.2		Campbell	47	-18	12.7	0.10
Salem				2.94	Clear Lake ††	42	-21	10.2	0.04
Salisbury				2.39	Clearwater †	40	-16	13.1	0.02
Somers †	53	-10	27.9	3.08	Collegeville	46	-15	17.1	0.00
South Dennis	46	-1	28.3	3.38	Cromwell †	36	-20	9.0	1.50
Springfield Arm'ry	43	-12	33.4	2.13	Crookston †	36	-20	7.0	
Taunton b	51	-8	25.9	4.16	Dassel ††	42	-16	13.3	
Taunton c	50	-15	25.5		Dawson †	50	-12	14.5	T.
Taunton d	51	-13	24.4	5.11	Excel †	36	-26	9.9	0.50
Turners Falls	48	-17	21.8	1.72	Farmington †	40	-14	12.5	0.05
Wakefield †	49	-12	23.5	3.42	Fergus Falls †	41	-18	11.6	0.20
Waltham				2.65	Fort Ripley †				0.08
Webster				3.36	Grand Meadow †	44	-10	13.2	0.35
Wellesley	50	-18	24.2	4.07	Granite Falls	46	-14	14.4	T.
Westboro †	56	-15	24.2	3.60	Hutchinson †	36	-12	12.6	T.
Williamstown	42	-16	22.5	2.29	Lake Vermilion †	41	-27	11.6	0.19
Winchendon				2.22	L Winnibigoshish †	41	-23	9.8	0.15
Winchester				3.04	Leech Lake †	40	-25	10.0	0.20
Winthrop	48	-8	24.7	3.13	Long Prairie	43	-20	8.4	0.02
Worcester a	46	-11	22.6	1.87	Maple Plain	42	-15	13.3	0.07
Worcester b	47	-11	21.2	2.84	Marfield †	40	-38	7.2	0.13
<i>Michigan.</i>					Mazeppa †	42	-10	14.6	0.30
Adrian	58	-8	23.4	3.22	Medford †	42	-20	13.5	T.
Albion	50	-7	23.6	2.81	Milan †	48	-15	13.0	0.13
Allegan	50	-6	23.4	1.69	Minneapolis a †	41	-16	13.6	0.08
Ann Arbor	48	-9	21.6	2.77	Minneapolis b †	43	-14	13.9	
Arbela ‡			16.0	1.55	Minneapolis City *††	48	-16	17.5	0.39
Ball Mountain	45	-14	20.4	2.63	Montevideo †	46	-14	15.2	0.05
Bear Lake	47	-10	19.5	0.49	Morris	40	-16	12.8	0.11
Benton Harbor	52	0	25.7	3.84	New London	40	-16	12.6	T.
Benzonia ‡	41	-9	18.4	2.02	New Richland ††	42	-10	16.3	
Berlin †	55	-14	20.7	1.49	New Ulm	46	-12	17.4	
Berrien Springs a †	52	1	25.8	2.80	Ortonville †				0.00
Berrien Springs b				1.63	Park Rapids †	38	-25	8.2	0.42
Birmingham	50	-10	22.0	2.47	Perham †	38	-22	10.0	
Boon	45	-27	17.2	1.47	Pine River †	39	-24	10.3	0.13

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Minnesota—Cont'd.					Missouri—Cont'd.				
Pokegama Falls ¹	45*	-42	6.0	0.21	McCune ¹	55	-4	26.8	2.55
Red Lake ¹	44	-25	9.8	0.14	Marceline.....	58	-1	26.8	2.75
Red Wing ¹				0.35	Marshall ¹	58	-1	26.8	2.30
Redwood Falls ¹				0.00	Mexico ¹	58	0	26.2	2.35
Rochester.....	50	-17	16.2	0.25	Mine La Motte ¹	64	10	33.8	3.38
Rolling Green ¹	42	-10	14.6	0.20	Neosho.....	62	-3	32.2	3.44
Rush City ¹	42	-26	12.0	0.10	New Boston.....	52*	6	24.3	1.86
Saint Charles ¹	46	-17	16.0	0.40	New Hartford ¹	60	-3	27.5	
Saint Cloud ¹	42	-17	13.8	0.00	New Haven ¹	58	6	31.2	4.27
Saint Peter ¹	44	-11	16.8	0.10	New Madrid.....	65	18	38.9	6.63
Sandy Lake Dam ¹	35	-27	8.6	0.23	New Palestine.....	61	8	30.7	1.75
Sauk Center.....	42	-22	9.4		Oakfield ¹	61	8	30.7	1.75
Starbuck.....	42	-16	11.6		Oak Ridge ¹	68	9	36.4	3.78
Sunrise City ¹	42	-24	12.5	0.25	Olden ¹	68	9	36.4	3.78
Wabasha ¹	44	-12	17.9	0.35	Oregon ¹	63	-1	25.8	2.20
Willmar ¹	40	-14	12.2	0.25	Oregon ¹	60	0	25.4	1.51
Winona.....	50	9	19.0	0.58	Palmyra.....	65	1	33.0	2.85
Worthington.....	41	-14	13.8	0.05	Panacea.....	65	1	33.0	2.85
Mississippi.					Paris.....	60	-2	28.6	2.33
Aberdeen ¹				6.53	Phillipsburg ¹	58	-3	30.3	1.93
Agricultural College.....	73	22	45.6	4.73	Pickering ¹	58	-4	23.2	1.55
Batesville ¹	67	7	41.8	7.16	Platte River ¹	55	6	24.2	2.15
Biloxi ¹	70	28	51.6	9.95	Poplar Bluff.....	64	12	36.5	5.00
Briers.....	72	27	48.8	5.86	Potosi.....	59	0	30.4	2.72
Brookhaven ¹	78	19	46.5	7.61	Princeton ¹	59	-2	24.0	2.40
Canton ¹	73	25	48.2	5.49	Round Spring.....	61	6	30.2	2.37
Clarksdale ¹	70	10	43.7	7.00	Saint Charles.....	61	6	30.2	2.37
Columbus ¹				4.88	Saint Joseph ¹	62	3	30.7	1.37
Crystal Springs ¹	76	24	53.4	7.26	Saint Louis.....	62	3	30.7	1.37
Edwards.....	75	23	47.6	5.49	Sarcoxie ¹	62	3	30.7	1.37
Enterprise ¹	77	20	47.6	6.97	Sedalia.....	59	-4	27.4	2.31
French Camp ¹	67	12	42.4	4.41	Shelbina.....	64	-10	31.0	1.83
Greenville ¹	67	25	43.8	3.18	Steffenville.....	64	-10	31.0	1.83
Greenville ¹	74	22	46.0	3.19	Stellada ¹	56	3	25.6	3.00
Hattiesburg ¹	77	24	51.0	5.92	Unionville.....	57	-3	27.8	2.73
Hernando ¹	77	24	51.0	5.92	Vermont ¹	55	-1	27.6	2.70
Itta Bena ¹	72*	24*	45.2*	6.46	Vilas.....				1.35
Jackson ¹	75	24	49.4	5.60	Virgil City.....	59	5	28.4	2.40
Kosciusko ¹	76	22	46.4	5.60	Warrington.....	59	5	28.4	2.40
Lake ¹	71	21	44.4	7.04	Wheatland.....				1.71
Leakesville ¹	73	25	49.5	9.50	Whiteside.....	53	5	28.4	3.00
Louisville ¹	74	19	45.3	5.26	Montana.				
Macon ¹	75	20	45.2	7.20	Boulder ¹	46	-24	14.0	0.14
Mayersville ¹	75	23	49.6	3.25	Choteau ¹	51	-24	20.9	0.10
Natchez ¹	78	25	49.6	6.10	Cokedale ¹	42	-23	13.8	2.00
Okolona ¹				5.21	Deer Lodge City ¹	54	-23	16.0	0.11
Palo Alto ¹	74	20	45.8	4.66	Fort Custer ¹	54	-23	16.0	0.11
Pontotoc ¹	70	18	44.4	7.61	Fort Keogh.....	46	-35	6.2	0.09
Port Gibson ¹	79	19	47.4	6.56	Fort Logan ¹	41	-28	9.6	0.20
Stonington ¹	76	28	51.0	3.53	Fort Missoula.....	44	-12	14.0	0.22
Thornton ¹	73	28	47.7	6.50	Glasgow ¹	52	-26	7.2	
Topton ¹	76	28	47.7	5.23	Glendive ¹	51	-23	11.0	0.20
University ¹	75	15	40.7	5.36	Great Falls.....	49	-20	20.0	0.21
Vaiden ¹	73	15	40.7	5.36	Martinsdale ¹	45	-27	18.0	0.30
Water Valley ¹	78	12	43.0	7.89	Mingusville ¹	64	-25	21.0	
Waynesboro ¹	77	22	47.1	7.65	Mosshell ¹	48	-20	17.4	0.15
Woodville ¹	77	25	51.2	7.31	Powder River.....	47	-32	9.6	
Yazoo City ¹	76	22	48.6	5.24	Red Rock ¹	41	-32	9.5	0.15
Missouri.					Virginia City ¹	41	-18	17.4	0.28
Akron.....				1.60	Nebraska.				
Appleton City ¹	59	-2	29.6	1.52	Agee ¹	48	-13	15.5	0.90
Arthur ¹	60	-12	19.9	2.50	Arbuckle ¹	52	-6	20.7	0.60
Bethany.....	60	-2	24.0	2.60	Ashland ¹	54	-6	20.7	0.72
Big Piney.....	66	8	35.2	2.43	Ashton ¹	52	-18	16.4	0.23
Birch Tree.....	66	7	35.1	2.43	Bassett ¹	53	-13	16.8	0.40
Bluffton ¹	66	8	35.2	2.43	Beatrice ¹	56	5	22.4	1.33
Boonville ¹	55	-2	26.6	2.65	Beaver City.....	56	-19	20.9	0.76
Brunswick.....	55	-2	26.6	2.65	Bratton ¹	65	-2	23.2	1.36
Carrollton ¹	60	-5	21.9	0.65	Burwell ¹	60	-10	21.9	0.20
Conception.....	60	-5	21.9	0.65	Callaway ¹	57	-19	19.4	0.15
Cowgill.....	54	-5	26.3	1.80	Columbus ¹	49	-10	17.6	0.49
Darkeville ¹				1.81	Cornlea.....				0.36
Downing.....				1.91	Creighton ¹	50	-11	15.5	0.20
East Lynne ¹				3.68	Crete.....	53	-8	20.0	0.88
Edge Hill ¹	64	4	34.0	1.27	Culbertson.....	60	-7	16.0	0.50
Eight Mile ¹	60	-4	28.0	1.29	David City ¹	56	-14	18.5	0.50
Eldon ¹	56	0	26.1	1.60	Ericson ¹	56	-14	18.5	0.50
Emma ¹				1.80	Fairbury ¹	54	-6	25.3	1.30
Fairport.....				1.90	Fort Robinson.....	52	-17	20.3	0.43
Farmersville.....				2.48	Fort Sidney.....	55	-18	22.2	0.50
Fayette.....	60	-3	28.0	2.40	Franklin ¹	61	-17	20.6	0.18
Fox Creek ¹	62	8	31.0	2.40	Geneva ¹	61	-11	20.4	1.55
Fulton.....				2.35	Gering ¹	48	-6	18.0	0.54
Gallatin ¹	58	-2	26.8	2.61	Glenwood ¹	48	-11	21.4	0.47
Gayoso ¹	56	-16	37.2	7.71	Haigler ¹	48	-21	20.9	0.92
Glasgow.....	56	-2	27.4	4.02	Harvard ¹	48	-13	15.4	0.55
Gordonville ¹				1.53	Hartington ¹	54	-10	19.1	1.00
Gorin ¹	72	7	32.6	2.75	Hebron ¹	48	-20	14.7	0.78
Grove Dale.....				0.99	Holdrege ¹	61	-10	22.5	0.80
Half Way.....	65	-2	28.4	2.27	Indianola ¹	55	-16	20.0	0.40
Harrisonville ¹	59	0	30.6	2.76	Kennedy ¹	53	-19	25.0	1.10
Hastain.....				2.59	Lexington ¹	62	-19	22.1	1.81
Hermantown ¹	61	3	32.0	1.84	Lynch ¹	54	-17	15.6	0.25
Houston.....	61	3	32.0	1.84	Madrid ¹	57	-16	19.9	0.65
Ironton ¹	61	3	32.0	1.84	Marquette ¹	51	-8		
Jefferson City ¹	59	-5	25.0	3.26	Minden ¹	56	-15	20.3	1.22
Lamar ¹	58	0	30.3	1.95	Mullen ¹	44	-1	19.5	0.10
Lamonte ¹	54	-8	23.6	1.44	Nebraska City ¹	51	-16	20.1	0.10
La Plata ¹	54	-8	23.6	1.44	Nesbit ¹	59	-10	17.1	
Lebanon.....	54	-8	23.6	1.44	Norfolk ¹	49	-10	17.1	
Lexington ¹	60	3	32.0	3.97					
Liberty.....	61	0	28.8	1.82					
Linn Creek.....	60	-10	29.4	1.46					
Louisiana Bridge ¹				2.08					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Nebraska—Cont'd.					New Jersey—Cont'd.				
North Loup †	53*	-15	20.7	0.31	Belvidere	54	-4	26.3	4.66
Ogallala †	52	-14	21.0		Beverly †	58	1	31.1	4.54
O'Neill †	51	-14	15.7	0.60	Billingsport *1	56	4	29.0	4.22
Ough †				0.30	Blairstown	57	-5	27.4	3.25
Plattsmouth †				2.23	Boonton	51	-4	26.6	3.39
Ravenna	55	-17	20.0	0.52	Bridgeton	60	9	35.5	5.64
Red Cloud				0.51	Camden	56	5	31.2	3.88
Santee Agency †	52	-13	16.5	0.18	Cape May	60	8	36.4	3.51
Seward *3	65	-3	19.8	1.95	Cape May C. H. †	62	5	35.2	4.33
Springview	55	-13	17.3	0.35	Charlotteburg	51	-8	24.5	5.04
Stanton *1	48	-13	16.9	0.20	Chester	47	-7	24.8	5.46
State Farm	56	-7	21.2	1.87	Deckertown	49	-11	23.6	4.35
Superior *5	57	-10	24.8	0.12	Dover	54	-4	24.5	4.64
Sutton	58	-8	20.9	1.40	Egg Harbor City	60	3	32.7	5.29
Table Rock *†1	58	-4	24.4	1.39	Elizabeth †	57	-1	30.1	4.38
Tecumseh †	57	-4	23.5	1.55	Franklin Furnace	48	-9	22.0	5.09
Wallace *1	56	-12	21.4	0.70	Franklinville	59	3	31.3	4.94
Weeping Water *1	52	-15	17.4	1.58	Freehold	60	0	29.8	3.45
West Point *†3		-8	17.9	0.40	Friesburg				4.16
Whitman *1	48	-12	14.3	0.20	Gillette	49	-3	26.0	4.51
Wilcox				0.63	Hammononton				4.82
York *1	53	0	21.2	1.00	Hanover	48	-2	27.4	4.29
Nevada.					Highland Park †	52	-1	28.3	3.86
Austin	47	-6	23.8	1.89	Hightstown	54	7	30.9	3.57
Battle Mountain *1		6	32.0	1.25	Inlaystown	53	2	31.2	3.93
Belleville *3	68	6	30.3	0.12	Junction				3.82
Belmont	47	-5	20.8	1.21	Lambertville	52	4	29.4	4.22
Beowawe *8	50	-8	23.3	1.15	Millville	62	4	34.2	4.27
Candelaria	67	-7	32.6	0.30	Moorestown	58	3	30.7	3.93
Carlin *8	42	-16	16.0	2.40	Newark *	50	0	27.8	4.71
Carson City †	61	-12	29.7	2.83	Newark †	52	-1	27.8	4.50
Cranes Ranch				1.54	New Brunswick *	55	-2	29.1	3.99
Downeyville	71	-2	35.2	0.80	New Brunswick †	52	2	29.3	3.89
Edgewood	54	-1	23.8	7.00	Newton	51	6	24.5	6.17
Elko *8		-20	17.3	2.00	Ocean City	61	5	34.4	3.29
Elko (near).	46	-30	14.7	1.00	Oceanic	53	7	32.4	4.78
Ely	46	-20		2.50	Paterson	55	-5	29.4	4.78
Empire Ranch †	45	-20	17.2	1.89	Pensauken				3.40
Eureka		3		2.14	Perth Amboy	54	2	30.0	2.99
Fenelon *8	45	-10	19.6	1.20	Plainfield	51	1	28.1	4.62
Genoa	63	-7	29.8	2.82	Rancocas *	55	1		4.00
Goldsboro *1	52	2	29.6	1.10	Readington *8	62	6	34.2	
Gold Hill	61	5	31.6	2.48	River Vale	53	-9	26.8	5.85
Halleck *1	48	-26	15.3	1.55	Salem	60	6	32.0	4.43
Hawthorne *8	56	16	34.3	0.40	Somerville	59	-5	29.4	4.32
Hawthorne †	59	6	34.3	0.42	South Orange	51	0	27.2	5.23
Hot Springs *1	67	10	31.4	0.40	Tenally	55	-5	27.6	5.30
Humboldt *8	42	-2	25.2	0.50	Toms River	59	2	32.0	5.62
Lewers Ranch	60	4	30.4	5.39	Trenton	56	1	32.6	3.30
Lovelock *8	58	1	31.1	0.45	Vineand.	61	3	33.2	5.21
McGill	46	-11	19.4	1.12	Whiting	60	2	33.2	3.53
Mill City *1	55	8	29.7		Woodbine	62	3	32.8	4.36
Osceola				2.37	New Mexico.				
Palisade *1	60	-6	19.8	2.80	Albert †	59	3	31.6	0.65
Palmetto	60	-5	24.6	1.00	Albuquerque †	62	7	32.6	0.31
Paradise *	44	4	25.4	1.00	Bloomfield †	59	-7	26.6	0.95
Reno *8	55	8	35.6	1.20	Chama †	51	-18	22.8	2.70
Reno State Univ'ty.	59	0	30.0	1.42	Coolidget	50	10	34.2	1.20
Saint Clair	61	-1	29.2	0.84	Deeding *8	71	26	46.3	0.66
South Camp †	62	-5	29.4	3.36	East Las Vegas †	58	-12	28.3	1.66
Stofel	50	-41	16.5	2.70	Estalina Springs †	58	-4	26.5	0.69
Sunnyside	53	-20	19.2	0.72	Folsom †	56	-12	23.4	1.20
Tecoma *8	38	-8	18.5	1.75	Fort Bayard	62	8	35.4	1.04
Toano *1	50	-10	17.4	0.80	Fort Stanton †	68	2	34.8	0.61
Tybo	45	-2	27.3	0.75	Fort Wingate	62	0	28.6	1.85
Verdi *8	60	5	28.8	5.42	Gallateo †	67	5	30.0	0.50
Virginia City	51	5	29.6	5.14	Gallinas Spring †	60	-8	29.1	1.10
Wadsworth *8	58	2	48.5	0.60	Halls Peak †	53	-15	23.5	1.55
Wells *	45	-29	13.1	2.22	La Luz †	60	10	42.1	0.75
Winemucca *8	51	-8	27.8	0.95	Las Cruces †	58	-12	28.3	1.66
New Hampshire.					Lordsburg *8	60	24	43.9	0.50
Alstead *4	41	-22	15.2	1.85	Los Lunas †	64	5	29.9	0.75
Antrim				3.31	Monero †	43	-12	14.5	0.98
Belmont				3.44	Olio †	59	4	33.0	0.78
Berlin	47	-34	11.4		Poiquaque				1.03
Berlin Mills	50	-35	10.0	1.96	San Marcial †	60	10	37.3	0.26
Bethlehem	44	-24	14.1	1.87	Socorro †	72	9	37.0	0.29
Brookline *1	50	-22	22.2	3.49	Taos †	52	-15	25.4	0.79
Concord	49	-19	20.1	2.25	New York.				
Dublin	44	-19	17.2	2.79	Addison	50	-15	23.7	1.89
Durham	47	-15	20.6	2.84	Akron				3.36
East Canterbury	44	-20	14.9	1.14	Alfred Center	49	-16	19.7	2.81
Grafton	48	-18	16.4	3.51	Angelica †	50	-21	19.5	2.81
Hanover	45	-29	18.4	2.02	Arcade	48	-16	20.0	2.50
Keene	48	-21	19.2	2.20	Arkwright	49	-2	22.9	
Lakeport				3.22	Atlanta				1.75
Lancaster	52	-28	16.4	1.25	Baldwinsville	47	-11	19.6	3.77
Littleton	45	-29	12.5	1.96	Bedford				5.46
Mine Falls				1.52	Big Sandy *10	48	-23	18.2	
Nashua	49	-18	20.5	2.95	Binghamton †	50	-15	21.6	2.98
Newton	48	-16	20.0	1.61	Bolivar				2.02
North Conway	48	-29	14.7	3.00	Bovina Center				3.40
Pennichuck St'n				2.68	Brentwood	53	-3	27.9	4.22
Peterboro	45	-26	17.6	3.34	Brookfield	45	-26	17.1	4.05
Plymouth	46	-24	13.0	2.75	Caroline	46	-18	19.5	
Sanbornston †	49	-19	17.2	1.62	Charlotte *10	45	0	23.2	
Stratford	59	-33	14.0	1.28	Cherry Creek				3.19
Wiers Bridge				4.16	Cooperstown †	46	-16	18.6	2.09
West Milan	49	-42	11.0	4.95	Cortland	42	-15	20.2	2.61
Wolfboro				2.02	De Kalb Junction				1.56
New Jersey.					Demster				3.16
Allaire	58	2	31.2		Eden Center	55	-11	21.6	3.80
Asbury Park	54	3	31.6	4.96	Ellis				1.93
Barnegat	60			4.30	Elmira *†1	54	-16	26.0	1.86
Bayonne	51	1	29.6	4.37	Factmoryville †	54	-21	24.1	2.66

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
New York—Cont'd.	0	0	0	Ins.	N. Dakota—Cont'd.	0	0	0	Ins.
Fleming.....	45	-13	20.6	...	Devils Lake.....	39	-24	5.0	0.35
Fort Niagara.....	48	-5	26.5	1.25	Dickinson.....	52	-21	9.5	0.35
Friendship.....	51	-20	31.0	3.17	Fargo.....	38	-22	6.2	0.09
Glens Falls.....	45	-22	17.3	...	Forman.....	48	-20	10.6	0.33
Gloversville.....	43	-24	15.7	3.19	Fort Berthold.....	36	-28	8.1	0.27
Hess Road St'n.....	40	-5	24.5	1.27	Fort Stevenson.....	43	-28	7.0	0.35
Honeycomb Brook.....	48	-13	21.5	3.14	Fort Yates.....	48	-21	9.4	0.00
Humphrey.....	54	-6	23.8	1.83	Gallatin.....	46	-28	6.9	0.15
Ithaca.....	47	-14	22.2	2.31	Grafton.....	44	-23	7.0	0.55
Jamestown.....	45	-10	24.5	...	Grand Forks.....	40	-20	9.9	0.35
Kings Station.....	...	...	...	3.15	Jamestown.....	52	-19	11.0	0.15
Lebanon Springs.....	48	-20	20.5	3.06	Kelso.....	49	-20	10.4	0.20
Le Roy.....	47	-9	21.1	0.66	Lemert.....	47	-25	7.9	0.01
Lockport.....	44	-10	21.8	2.51	McKinney.....	39	-25	0.0	0.10
Lovell.....	43	-30	15.0	3.43	Milton.....	40	-28	3.9	...
Madison Barracks.....	42	-24	17.2	2.62	Minto.....	46	-22	8.2	0.29
Malone.....	42	-21	14.5	3.20	Napoleon.....	38	-23	7.4	0.45
Middletown.....	49	-9	22.0	2.36	New Salem.....	55	-23	12.5	...
Minnewaska.....	44	-10	20.7	3.10	Oakdale.....	44	-24	12.8	0.20
Mount Morris.....	53	-17	21.2	2.78	Portal.....	46	-40	5.3	0.20
Newark Valley.....	...	...	...	2.80	Power.....	44	-20	10.2	0.75
New Lisbon.....	46	-22	18.0	1.75	Saint John.....	46	-26	7.8	0.80
North Hammond.....	44	-18	16.0	0.92	Sheyenne.....	40	-23	8.7	...
Number Four.....	38	-25	14.2	3.43	Valley City.....	44	-21	9.8	0.27
Ogdensburg.....	41	-20	15.4	...	Wahpeton.....	43	-17	11.4	...
Oxford.....	46	-17	21.5	2.46	Washburn.....	49	-27	10.5	0.04
Palermo.....	43	-21	18.1	3.14	Wild Rice.....	...	...	7.2	0.30
Perry City.....	45	-22	19.5	2.54	Willow City.....	43	-28	4.5	...
Phoenix.....	...	...	...	2.38	Woodbridge.....	39	-27	2.6	0.07
Pine City.....	...	...	...	2.70	Ohio.....	...	...	...	...
Plattsburg B'ks.....	45	-22	12.8	1.37	Akron.....	58	-1	27.6	3.25
Port Jervis.....	48	-12	22.8	4.03	Annapolis.....	62	5	28.6	2.84
Potsdam.....	39	-10	15.3	1.70	Arcanum.....	52	0	26.4	3.67
Poughkeepsie.....	54	-17	21.3	3.05	Ashland.....	58	0	32.3	2.75
Romulus.....	46	-11	21.5	2.64	Athens.....	68	0	32.3	3.90
Rondout.....	47	-15	22.5	3.91	Auburn.....	65	-13	24.4	3.13
Saranac Lake.....	49	-31	13.4	1.96	Bangorville.....	58	-1	26.1	2.81
Setauket.....	50	1	28.5	4.40	Batavia.....	65	-5	28.5	2.45
South Canisteo.....	50	-17	21.7	3.21	Bellefontaine.....	65	-5	28.5	3.98
South Kortright.....	45	-17	20.5	1.19	Benton Ridge.....	50	-8	27.6	3.22
Stillwater.....	50	-20	18.3	2.97	Bethany.....	64	8	31.2	4.13
Turin.....	40	-19	14.7	3.79	Big Prairie.....	54	-1	26.3	3.32
Varysburg.....	57	-20	21.6	3.55	Binola.....	58	-8	28.2	2.76
Wappingers Falls.....	50	-15	20.6	3.43	Bissella.....	55	-8	25.3	3.20
Warwick.....	...	...	...	3.34	Bladensburg.....	63	-9	28.0	3.41
Watertown.....	49	-18	21.2	2.23	Bloomington.....	65	3	30.5	3.20
Wedgwood.....	57	-15	22.3	3.09	Bowling Green.....	61	-6	25.0	3.71
West Chazy.....	...	...	...	1.40	Bucyrus.....	64	-1	27.2	2.67
West Point.....	53	-9	26.4	3.94	Caledonia.....	64	-1	27.2	1.16
Willets Point.....	50	1	26.7	6.00	Cambridge.....	63	-6	28.6	3.57
North Carolina.....	...	...	...	...	Canal Dover.....	60	-7	27.3	3.33
Asheville.....	68	13	40.0	3.81	Canton.....	59	1	27.6	2.30
Auburn.....	72	22	46.1	3.49	Cardington.....	61	-9	27.0	2.75
Bailey.....	70	22	44.1	5.52	Carrollton.....	61	-1	27.9	3.61
Bakersville.....	60	-2	37.9	5.75	Celina.....	60	5	31.1	2.17
Blowing Rock.....	60	5	33.6	5.18	Cherry Fork.....	66	1	31.9	3.08
Bryson City.....	...	...	...	5.87	Chicago.....	...	...	...	2.29
Chapel Hill.....	72	17	43.0	3.65	Circleville.....	...	...	...	3.94
Columbus.....	62	11	39.6	5.78	Cleveland.....	59	0	27.8	3.67
Currituck Inlet.....	...	...	...	6.11	Coalton.....	71	-10	33.8	3.30
Experiment'l Farm.....	71	18	45.5	3.96	Colebrook.....	65	-5	35.1	3.73
Fair Bluff.....	...	...	...	4.17	Dayton.....	59	5	30.7	3.31
Falkland.....	74	27	49.6	5.42	Dayton.....	59	5	30.7	3.79
Fayetteville.....	...	...	...	3.47	Debauch.....	63	-2	26.9	3.21
Flat Rock.....	65	13	39.2	6.54	Demos.....	60	6	30.5	2.87
Forest Hill.....	62	15	40.3	5.32	Dupont.....	61	-1	27.2	2.74
Greenville.....	...	...	...	3.68	Ellsworth.....	56	-3	26.3	2.70
Henderson.....	70	17	43.0	6.52	Elyria.....	60	-1	27.1	1.93
Highlands.....	60	6	37.0	9.64	Frankfort Harbor.....	56	0	27.2	...
Horse Cove.....	63	11	39.8	7.95	Findlay.....	61	-5	26.5	4.09
Lenoir.....	63	18	40.7	5.66	Fosteria.....	61	0	26.9	2.81
Lillington.....	...	...	...	3.69	Frankfort.....	64	-3	32.0	3.98
Littleton.....	72	9	41.4	4.79	Garrettsville.....	58	-14	24.1	2.76
Louisburg.....	70	19	42.1	4.28	Georgetown.....	64	8	34.0	3.52
Lynn.....	70	...	41.6	5.54	Granville.....	64	-5	28.6	3.30
May.....	74	20	48.0	4.00	Gratiot.....	63	-11	30.1	3.31
Mocksville.....	68	16	44.3	4.66	Greenfield.....	60	-2	31.4	3.19
Morganton.....	68	16	42.5	5.00	Green Hill.....	60	-9	26.5	2.44
Mount Airy.....	67	14	40.0	4.87	Greenville.....	59	-2	26.6	4.13
Mount Pleasant.....	69	17	45.6	3.17	Guyville.....	67	-5	33.3	3.39
Murphy.....	...	...	...	6.40	Hackney.....	64	-2	31.5	3.65
Newbern.....	72	29	46.6	4.08	Hanging Rock.....	70	8	36.2	4.20
Oak Ridge.....	67	15	40.8	4.67	Harbor.....	55	-1	26.2	1.23
Pittsboro.....	67	19	42.2	3.50	Hedges.....	60	-6	22.2	3.41
Raleigh.....	74	22	46.6	...	Hillhouse.....	56	-6	25.4	1.95
Rockingham.....	73	19	46.4	2.60	Hillsboro.....	59	-3	32.8	3.17
Roxboro.....	67	14	42.4	4.63	Hiram.....	56	-8	24.2	2.41
Rutherford Col.....	64	11	37.9	5.71	Jacksonboro.....	64	5	30.1	4.35
Salisbury.....	64	18	45.1	4.35	Kenton.....	63	1	28.9	3.64
Salisbury.....	...	...	...	3.66	Kilbourne.....	64	-3	28.2	2.42
Saxon.....	68	14	39.8	5.87	Killbuck.....	60	0	28.6	2.87
Selma.....	70	20	45.6	3.56	Leipsic.....	59	0	29.0	2.97
Shelby.....	66	16	42.2	4.80	Levering.....	60	-10	25.5	3.37
Siloam.....	73	21	50.9	4.86	Logan.....	67	1	31.9	3.14
Soapstone M'f.....	70	16	44.3	4.01	Lordstown.....	60	-9	26.6	2.65
Southern Pines.....	74	19	47.0	2.74	Lowell.....	67	-2	32.9	2.57
Tarboro.....	75	21	46.8	4.80	McArthur.....	66	-1	32.9	2.73
Washington.....	73	23	48.4	5.24	McConnelville.....	66	-5	31.7	3.35
Weldon.....	72	20	43.4	4.67	Mansfield.....	...	...	...	3.38
Willets Point.....	73	20	44.7	4.48	Marietta.....	...	...	...	3.43
North Dakota.....	...	...	...	...	Marietta.....	62	9	37.5	3.62
Ashley.....	38	-26	6.3	0.10	Marion.....	62	1	27.7	2.96
Berlin.....	47	-21	9.3	...	...	...	...	...	...
Bottineau.....	39	-28	4.7	0.02	...	...	...	...	...
Churchs Ferry.....	41	-24	6.4	0.20	...	...	...	...	...

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Ohio—Cont'd.					Oregon—Cont'd.				
Milfordton.....	60	4	27.2	3.34	Lakeview.....	45	0	21.2	4.92
Milligan.....	61	-15	31.1	3.21	Langlois.....	62	29	44.2	11.92
Millport.....	59	-8	28.0	2.44	Lone Rock.....	51	-8	26.8	1.23
Montpelier.....	59	-5	23.4	3.20	McMinnville a.....	55	21	37.7	6.10
Napoleon.....	59	-1	25.6	1.98	McMinnville b.....	54	20	38.0	5.01
Nelsonville.....	64	2	33.0	3.41	Merlin.....	62	18	39.4	4.31
New Alexandria.....	59	6	29.4	4.30	Monmouth.....	59	24	41.8	4.90
New Berlin.....	58	0	26.4	1.81	Mount Angel.....	55	20	38.3	4.28
New Bremen.....	61	-1	26.0	3.18	Newbridge.....	48	7	32.4	1.40
New Comerstown.....	62	-2	28.4	2.97	Newport.....	59	23	42.1	8.98
New Holland.....	.....	.....	.....	3.95	Oregon City.....	50	19	38.0	6.10
New Paris.....	56	3	27.7	2.98	Pendleton.....	55	2	31.9	1.39
North Lewisburg.....	62	0	28.0	4.95	Portland.....	57	18	38.3	5.82
North Royalton.....	57	-7	25.6	2.34	Riddles.....	64	22	38.4	5.33
Oberlin.....	59	-3	27.5	1.72	Roseburg.....	65	26	41.4	4.03
O. S. University.....	64	3	29.3	2.96	Salem a.....	56	22	42.1	4.49
Orangeville.....	54	-7	25.1	1.60	Salem b.....	56	21	38.8	4.32
Pataskala.....	64	-5	29.0	3.89	Sheridan.....	56	23	39.2	5.55
Plattsburg.....	61	3	28.9	3.83	Silverton.....	56	18	38.2	4.71
Pomeroy.....	65	6	34.0	2.65	Siskiyou.....	48	17	32.7	6.65
Portsmouth a.....	.....	.....	.....	3.49	Sparta.....	54	-5	21.6	3.58
Portsmouth b.....	76	12	37.0	3.79	Springbrook.....	51	19	37.8	4.75
Ridge.....	61	2	29.0	3.64	Springfield.....	58	18	37.1	11.51
Ridge v'le Corners.....	59	-5	24.8	2.21	The Dalles.....	55	3	34.4	1.83
Ripley.....	64	-7	32.9	3.14	Toledo.....	60	20	41.3	13.05
Rittman.....	57	-5	25.3	3.32	Umatilla.....	.....	.....	.....	0.40
Rush Creek.....	.....	.....	.....	3.49	Vale.....	50	0	28.4	0.82
Sharon Center.....	57	4	28.1	2.16	Vernonia.....	49	9	35.3	9.35
Shenandoah.....	58	-3	26.3	2.23	West Fork.....	60	23	39.9	9.39
Sidney.....	.....	.....	.....	4.21	Weston.....	52	-1	30.0	2.24
Springboro.....	60	-2	26.8	2.28	Williams.....	59	14	37.7	5.49
Spring Valley.....	60	-2	26.8	2.28	Pennsylvania.....				
Stoutsville.....	59	-8	24.0	2.24	Altoona.....	58	10	36.3	1.82
Sylvania.....	68	-1	34.0	2.92	Aqueduct.....	56	0	30.6	4.69
Thurman.....	61	0	27.2	3.43	Beaver Dam.....	.....	.....	.....	2.67
Tiffin.....	61	0	27.2	3.43	Blooming Grove.....	47	-16	23.4	3.40
Upper Sandusky.....	58	1	27.2	2.85	Bloomsburg.....	48	-2	26.2	2.22
Vanceburg.....	66	12	37.6	3.28	Blue Knob.....	45	-6	24.9	4.97
Van Wert.....	61	-3	25.4	3.41	Brookville.....	.....	.....	.....	2.59
Vermillion.....	58	0	26.3	2.07	Browsers Look.....	.....	.....	.....	4.11
Vicksery.....	55	0	25.8	3.41	Carlisle.....	56	-2	28.9	4.53
Walnut.....	.....	.....	.....	2.66	Clarion.....	.....	.....	.....	2.97
Warren.....	59	-8	27.5	3.02	Coatesville.....	59	2	30.6	4.60
Wauson.....	58	-7	24.6	3.40	Confience.....	.....	.....	.....	3.57
Waverly.....	68	9	33.3	3.25	Coopersburg.....	54	1	28.6	4.26
Waynesville.....	.....	.....	.....	4.47	Davis Island Dam.....	.....	.....	.....	2.63
Wellington.....	59	-4	27.4	3.04	Doylestown.....	.....	.....	.....	4.28
Westerville.....	61	2	29.9	3.34	Drifton.....	54	-10	27.8	3.40
Weymouth.....	57	-7	25.9	2.69	Du Bois.....	49	-24	20.2	2.73
Wheeler.....	.....	.....	.....	3.50	DuBois.....	.....	.....	.....	2.47
Wooster.....	64	-1	26.7	3.37	DuBois.....	49	-24	20.2	2.73
Wooster b.....	.....	.....	.....	3.30	East Mauch Chunk.....	53	-8	26.0	4.11
Youngstown.....	52	-2	25.6	2.88	Easton.....	51	-2	26.6	3.39
Zanesville.....	.....	.....	.....	2.47	Edinboro.....	40	2	21.6	.....
Oklahoma.....					Elwood Junction.....	.....	.....	.....	2.14
Anadarko.....	68	8	35.4	2.60	Emporium.....	53	-9	25.6	3.08
Arapahoe.....	62	6	32.0	0.50	Fk's of Neshaminy.....	.....	.....	.....	3.77
Buffalo.....	70	2	35.7	1.80	Frederick.....	.....	.....	.....	4.11
Burnett.....	68	6	36.6	1.46	Freeport.....	.....	.....	.....	3.32
Clifton.....	70	2	35.7	1.80	Gettysburg.....	.....	.....	.....	3.89
Enid.....	74	-3	32.2	0.87	Grampian.....	50	-6	23.9	2.14
Fort Reno.....	68	8	38.8	0.50	Greensboro.....	.....	.....	.....	3.07
Fort Sill.....	68	-3	35.8	0.72	Greenville.....	57	-2	25.7	1.62
Fort Supply.....	63	-6	26.6	1.04	Hamburg.....	53	3	28.3	4.47
Guthrie.....	63	7	34.1	1.43	Hollidaysburg.....	57	9	27.2	4.23
Keokuk Falls.....	65	7	33.2	1.45	Honesdale.....	49	-20	22.8	3.63
Mangum.....	74	.....	.....	1.21	Huntingdon.....	57	-6	29.0	3.44
Ponca.....	60	-1	31.6	3.04	Johnstown.....	54	1	26.8	3.38
Pond Creek.....	60	3	29.6	1.03	Kane.....	48	-8	23.0	2.30
Winnview.....	62	5	33.2	0.70	Kennett Square.....	57	3	30.7	5.08
Oregon.....					Kilmer.....	54	2	21.8	4.57
Albany.....	58	21	39.1	5.49	Lancaster.....	53	1	39.9	3.50
Albany b.....	62	20	40.3	4.26	Lansdale.....	.....	.....	.....	4.09
Arlington.....	56	1	32.9	0.97	Lebanon.....	52	-2	28.4	4.23
Ashland a.....	52	13	35.5	3.50	Le Roy.....	45	-16	20.8	3.04
Ashland b.....	57	10	36.0	2.56	Lewisburg.....	51	-16	26.2	2.46
Aurora.....	58	25	41.6	4.82	Ligonier.....	58	-4	29.5	2.78
Aurora (near).....	55	20	38.6	5.24	Lock Haven.....	55	-6	27.8	3.67
Bandon.....	54	27	43.2	10.87	Lock No. 4.....	.....	.....	.....	2.74
Beulah.....	45	-7	22.8	0.64	Loysburg.....	60	5	29.4	2.31
Brownsville.....	60	17	38.6	5.04	Mahoning.....	.....	.....	.....	3.06
Canyon City.....	58	4	30.1	1.87	Newcastle.....	54	-3	27.4	1.76
Cascade Locks.....	52	16	35.4	10.71	Oil City.....	53	.....	.....	2.94
Comstock.....	63	22	38.3	6.35	Ottawa.....	.....	.....	.....	3.59
Cornelius.....	58	14	36.4	7.30	Parker.....	.....	.....	.....	2.72
Corvallis a.....	57	21	38.0	5.29	Philadelphia.....	56	.....	.....	3.96
Corvallis b.....	57	18	37.5	5.36	Philadelphia b.....	56	4	32.4	4.33
Corvallis (near).....	56	20	37.9	7.87	Philadelphia c.....	54	4	31.6	4.74
Crook.....	47	-16	25.6	1.70	Phoenixville.....	56	4	30.0	3.99
East Portland.....	57	15	.....	4.88	Point Pleasant.....	.....	.....	.....	4.63
Eugene.....	.....	.....	.....	4.00	Pottstown.....	54	3	29.2	4.25
Forest Grove.....	55	11	34.6	9.34	Quakertown.....	51	-8	26.9	4.16
Gardiner.....	59	27	42.6	8.65	Reading.....	.....	.....	.....	5.59
Glenns.....	54	13	35.5	18.44	Ridgway.....	.....	.....	.....	2.36
Glenns Pass a.....	46	17	37.8	3.95	Saegertown.....	53	-14	23.6	2.70
Glenns Pass b.....	56	24	39.8	1.86	Salem Corners.....	57	-10	22.5	4.90
Happy Valley.....	49	-11	33.9	1.78	Salisbury.....	.....	.....	.....	3.29
Heppner.....	63	1	33.2	0.95	Seisholtzville.....	.....	.....	.....	4.32
Hood River (near).....	50	-4	30.4	5.03	Selins Grove.....	52	-6	29.0	3.07
Hubbard.....	54	22	39.2	4.97	Shinglehouse.....	51	-18	21.6	3.82
Jacksonville.....	58	15	36.0	4.09	Smithport.....	51	-15	22.8	3.35
Joseph.....	44	-5	18.3	1.00	Smiths Corners.....	.....	.....	.....	3.47
Junction City.....	56	24	38.3	1.77	Somerset.....	56	0	26.2	5.20
Lafayette.....	55	21	39.2	5.43	South Eaton.....	58	-9	24.8	2.79
La Grande.....	44	2	27.6	1.32	State College.....	51	-1	26.4	3.39
.....	.....	.....	.....	.....	Stoyestown.....	.....	.....	.....	4.84

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Pennsylvania—Con.				<i>Ins.</i>	Tennessee—Cont'd.				<i>Ins.</i>
Swarthmore.....	54	5	32.2	3.17	Carthage.....	8.43			
Uniontown.....	62	9	33.6	3.35	Charleston.....	5.81			
Warren.....	56	-16	23.4	2.25	Clarksville.....	69	17	37.9	
West Chester.....	53	2	29.9	4.66	Clinton.....	7.34			
West Newton.....	52	2	29.1	3.99	Columbia.....	9.59			
Wilkesbarre.....	56	-1	28.4	4.50	Covington.....	65	11	38.3	
York.....	54	-2	29.6	4.20	Florence Station.....	66	14	39.5	
Rhode Island.					Franklin.....	67	16	38.8	
Bristol.....	43	-4	26.9	3.75	Greenville.....	68	16	40.6	
Kingston.....	47	-9	24.9	4.95	Harrogate.....	69	18	39.6	
Lonsdale.....	47	0	30.1	4.00	Hohenwald.....	64	10	38.3	
Newport.....	51	-7	26.1	3.81	Jacksboro.....	68	15	37.4	
Pawtucket.....	49	-4	27.0	4.55	Jackson.....	62	6	37.9	
Providence.....	49	-8	25.0	4.19	Johnson City.....	67	13	40.9	
South Carolina.					Johnsonville.....	69			
Aiken.....	73	22	49.6	4.49	Loudon.....	62	17	39.5	
Anderson.....	69	17	46.2	3.71	Lynnville.....	62	17	39.5	
Blacksburg.....	69	17	46.2	3.71	Missionary Ridge.....	68	17	38.6	
Blenheim.....	69	17	46.2	3.71	Newport.....	68	17	38.6	
Camden.....	69	17	46.2	3.71	Nunnally.....	69	16	39.8	
Central.....	69	17	46.2	3.71	Parkville.....	65	19	42.5	
Cheraw.....	75	21	48.6	3.02	Ridgely.....	68	15	38.4	
Clemson College.....	69	17	46.2	3.71	Rockwood.....	65	19	42.5	
Conway.....	69	17	46.2	3.71	Rogersville.....	65	19	42.5	
Coronaco.....	69	17	46.2	3.71	Rugby.....	67	10	35.4	
Cross Hill.....	68	20	47.4	4.50	Savannah.....	69	9	41.1	
Darlington.....	73	26	50.7	5.23	Springdale.....	66	17	39.5	
Edisto.....	69	17	46.2	3.71	Strawberry Plains.....	65	4	37.3	
Effingham.....	71	20	46.6	4.34	Trenton.....	72	15	39.1	
Flint Hill.....	71	20	46.6	4.34	Waynesboro.....	66	9	37.2	
Gaffney.....	72	26	53.0	3.18	Texas.				
Georgetown.....	72	26	53.0	3.18	Arlington.....	81	16	43.2	
Greenville.....	72	26	53.0	3.18	Arthur City.....	82	16	42.9	
Greenwood.....	72	26	53.0	3.18	Austin.....	79	23	48.5	
Hollands Store.....	72	26	53.0	3.18	Belton.....	81	20	47.7	
Kingstree.....	73	20	48.3	5.11	Boerne.....	76	20	46.2	
Little Mountain.....	73	20	48.3	5.11	Brady.....	80	15	44.0	
Longshore.....	71	19	47.0	5.57	Brasoria.....	83	25	54.5	
McCormick.....	65	24	47.9	3.82	Brenham.....	78	22	50.1	
Martins.....	69	17	46.2	3.71	Brownwood.....	78	16	43.2	
Mount Carmel.....	69	17	46.2	3.71	Burnet.....	73	19	47.8	
Pinopolis.....	69	17	46.2	3.71	Camp Eagle Pass.....	89	18	51.3	
Port Royal.....	72	30	53.1	3.28	Childress.....	71	7	37.8	
Saint Stephens.....	68	20	47.3	4.60	Coldwater.....	64	-9	23.7	
Santuck.....	68	20	47.3	4.60	Columbia.....	80	26	54.3	
Simpsonville.....	71	17	45.3	3.17	Corsicana.....	81	18	45.6	
Society Hill.....	74	21	48.6	4.07	Corsicana.....	75	13	44.4	
Statesburg.....	73	23	49.9	5.00	Cuero.....	84	27	51.8	
Tatum Station.....	71	23	45.8	2.97	Dallas.....	79	16	44.5	
Timmonsville.....	71	23	45.8	2.97	Devine.....	80	21	51.2	
Trenton.....	73	24	50.0	6.61	Duval.....	80	22	49.7	
Trial.....	76	22	52.8	5.17	Estrella.....	80	16	43.1	
Watts.....	70	21	47.8	3.87	Flower Bluff.....	84	28	55.2	
Yorkville.....	71	18	47.2	3.03	Forestburg.....	76	12	41.8	
South Dakota.					Fort Brown.....	88	27	61.1	
Aberdeen.....	54	-18	12.9	T.	Fort Clark.....	82	26	52.2	
Alexandria.....	54	-25	15.9	T.	Fort Hancock.....	76	-1	38.0	
Ashcroft.....	40	-18	9.7	0.00	Fort McIntosh.....	86	21	57.0	
Bowdle.....	44	-23	8.3	0.40	Fort Ringgold.....	94	27	60.8	
Britton.....	47	-18	13.7	T.	Fredericksburg.....	75	20	46.2	
Brookings.....	45	-20	10.2	T.	Gainesville.....	78	16	39.9	
Castlewood.....	45	-20	10.2	T.	Grape Vine.....	78	16	42.8	
Clark.....	50	-23	12.2	T.	Hallettsville.....	80	26	51.4	
Cross.....	50	-25	18.9	0.48	Hartley.....	63	-2	19.6	
De Smet.....	54	-22	13.4	0.00	Highland.....	76	16	41.6	
Faulkton.....	52	-18	11.5	0.07	Houston.....	79	23	50.6	
Flandreau.....	42	-17	13.6	T.	Huntsville.....	74	22	49.9	
Forestburg.....	45	-20	11.5	0.20	Kent.....	75	27	52.5	
Fort Meade.....	54	-15	21.6	0.12	Kyle.....	75	27	52.5	
Fort Sully.....	63	-15	19.4	T.	Longview.....	80	19	48.8	
Frankfort.....	48	-22	11.4	0.05	Luling.....	79	24	51.6	
Gale.....	45	-23	10.3	0.00	McGregor.....	60	17	33.5	
Gary.....	45	-16	13.0	0.00	Menardville.....	80	15	43.6	
Greenwood.....	53	-13	18.0	0.36	Mountain Spring.....	78	15	42.9	
Highmore.....	43	-20	13.4	0.05	New Braunfels.....	79	22	50.0	
Hotchkiss.....	48	-26	11.0	0.10	Orange.....	78	26	53.1	
Hot Springs.....	52	-21	20.1	0.84	Paris.....	74	15	42.3	
Howard.....	43	-20	10.7	T.	Roby.....	75	11	37.8	
Kimball.....	46	-21	12.8	0.25	Rockport.....	76	30	53.6	
Millbank.....	47	-14	16.8	T.	San Antonio.....	81	24	51.0	
Northville.....	42	-20	12.0	0.05	San Marcos.....	72	8	36.3	
Oelrichs.....	46	-19	14.2	2.25	Silver Falls.....	78	17	42.7	
Parker.....	46	-17	11.6	T.	Sulphur Springs.....	88	17	45.0	
Parkston.....	48	-15	12.2	0.07	Temple.....	79	18	45.0	
Piedmont.....	55	-15	16.4	0.13	Twohig.....	90	24	60.8	
Rosebud.....	55	-20	15.7	T.	Victoria.....	80	28	54.3	
Shiloh.....	42	-16	13.2	T.	Waco.....	80	20	48.2	
Sioux Falls.....	54	-15	22.3	0.73	Weatherford.....	76	13	41.6	
Spearfish.....	65	-15	19.8	0.20	Wichita Falls.....	80	10	43.1	
Tyndall.....	49	-13	17.4	T.	Utah.				
Vermillion.....	43	-19	12.8	0.05	Blue Creek.....	43	-5	18.0	
Watertown.....	52	-24	12.2	0.70	Castle Gate.....	44	-5	22.0	
Westwater.....	34	-20	9.4	T.	Cisco.....	54	10	30.7	
Wessington Spgs.....	52	-17	14.2	0.22	Coalville.....	44	-22	11.9	
Tennessee.					Corinne.....	55	-5	22.2	
Andersonville.....	62	17	38.9	6.66	Deseret.....	46	-10	22.5	
Ashwood.....	60	16	38.9	9.56	Fillmore.....	50	-11	24.4	
Bolivar.....	58	16	37.3	9.24	Fort DuChesne.....	39	-18	8.8	
Bristol.....	65	14	38.5	2.42	Glendale.....	51	3	30.0	
Byrdstown.....	70	14	38.7	6.00	Grouse Creek.....	43	-12	17.2	
					Heber.....	40	-22	12.0	

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Utah—Cont'd.				<i>Ins.</i>	Washington—Cont'd.				<i>Ins.</i>
Kelton.....	49	-2	25.3	0.70	Stillaguamish.....	53	10	35.6	3.45
Koosharem.....	48	-15	18.0	0.33	Sunnyside.....	60	-14	30.4	1.01
Lake Park.....	45	3	24.6		Tacoma.....	52	19	37.4	5.11
Levan.....	50	-14	20.5	1.55	Union City.....	52	18	36.1	10.66
Logan.....	42	-14	16.6	1.45	Vashon.....	53	9	32.2	4.92
Lossee.....	50	-4	24.6	0.40	Waterville.....	4	17.9	1.10	
Manti.....	50	-13	18.9		Wenatchee Lake.....	40	-14	22.9	5.45
Moab.....	60	9	32.6	0.60	West Ferndale.....	52	14	34.0	3.26
Ogden.....	42	6	25.1	0.75	West Virginia.				
Ogden.....	48	6	26.2	1.02	Beverly.....	64	0	34.6	7.48
Parowan.....	46	-4	23.2	0.85	Bloomery.....	54	3	30.5	3.86
Promontory.....	48	-15	20.2	1.15	Bluefield.....	60	8	33.6	5.73
Provo City.....	50	-20	15.0	1.50	Buckhannon.....	64	5	32.9	3.60
Randolph.....	40	-34	10.8	1.26	Burlington.....	62	-2	32.8	3.30
Richfield.....	52	-3	24.2	0.66	Central Station.....	64	0	35.1	3.57
Saint George.....	68	11	36.3	0.40	Charleston.....	64			4.57
Silver Lake.....	46	-14	10.9	4.70	Cloverdale.....	64			2.05
Singletree.....	43	-10	17.1	1.04	Davis.....	55	1	27.9	3.33
Snowville.....	38	-15	14.9	2.20	Elkhorn.....	62	14	38.3	4.41
Soldier Summit.....	41	12	28.5	0.50	Fairmont.....	62			3.53
Terrace.....	60	-15	17.8	2.25	Glennville.....	65	11	34.3	4.34
Thistle.....	50	-23	20.9	2.29	Grafton.....	63	10	32.8	3.84
Vermont.					Harpers Ferry.....	63			3.33
Brattleboro.....	50	-23	20.9	2.29	Hinton.....	63	4	31.3	3.77
Burlington.....	43	-14	18.2	0.99	Marlinton.....	63	4	31.3	3.39
Cornwall.....	43	-21	15.6	3.05	Martinsburg.....	56	3	31.8	2.52
Enosburg Falls.....	44	-30	15.3	2.35	Morgantown.....	67	10	35.0	3.56
Hartland.....	47	-30	14.8	2.04	New Martinsville.....	71	10	35.0	3.26
Irassburg.....	42	-30	11.2	3.45	Parkersburg.....	67	4	33.8	3.60
Jacksonville.....	48	-32	14.9	2.72	Phillippi.....	60	-5	27.8	3.08
Norwich.....	47	-30	17.1	1.97	Pleasant Hill.....	60	-5	27.8	6.71
Simonsville.....	45	-27	13.6	3.80	Point Pleasant.....	74	9	36.9	3.31
Stratford.....	38	-18	15.9	3.80	Raleigh.....	58	4	32.9	5.70
Vernon.....	44	-26	18.2	2.31	Rowlesburg.....	62	3	33.7	3.08
Wells.....	45	-22	16.4	1.61	Sandyville.....	62	3	33.7	2.98
Woodstock.....	51	-36	15.2	2.20	Spencer.....	60	5	38.1	3.97
Virginia.					Tannery.....	62	6	31.0	3.90
Alexandria.....	62	12	35.6	5.15	Weston.....	65	12	35.6	3.90
Ashland.....	72	18	40.2	4.35	Weston.....	65	12	35.6	3.90
Avon.....	70	13	38.2	4.42	Wheeling.....	66	13	35.0	2.83
Bedford City.....	66	14	39.1	4.03	Wheeling.....	66	13	35.0	2.83
Big Stone Gap.....	62	9	35.8	6.16	Wisconsin.				

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Wyoming.	°	°	°	In.	Canada.	°	°	°	In.
Big Horn Ranch †	48	-28	16.4	0.52	Fort Francis, Ont.	37	-31	4.9	0.02
Camp Pilot Butte	48	-17	19.6	0.69	Mexico.				
Fort McKinney	48	-22	19.6	0.29	Cuidad P. Diaz	88	28	55.5	0.00
Fort Washakie	49	-26	15.1	0.45	Leon de Aldamas	78	41	61.2	T.
Fort Yellowstone †	41	-24	12.2	1.12	Mazatlan	76	53	64.0	T.
La Barge †	45	-24	12.9	0.56	Mexico	75	39	58.8	0.00
Lander	45	-24	16.2	0.10	Puebla	70	41	57.6	T.
Laramie	42	-24	13.3	0.90	Topolobampo *3	78	50	60.0	0.00
Saratoga †	45	-32	9.2	0.75	West Indies.				
Sheridan	42	-24	13.8	0.75	Grand Turk Island				0.20
Sundance	64	-12	23.2	0.30	Hamilton, Ber	71	50	62.5	2.80
Wheatland †									

Reports received too late to be used in general discussion of weather for February, 1894.

Alabama.					Georgia—Cont'd.				
Eufaula †	76	36	51.8	8.33	Whitesburg †				6.10
Mount Willing					Illinois.				
Georgia.					Atwood *3	58	0	22.2	2.58
Alapaha †	74	36	53.8	8.33	Kansas.				
Albany †	75	25	51.6	8.71	Collyer *3	60	-4	18.2	1.40
Americus †	77	23	52.6	7.49	Ellis *3	64	-2	25.4	
Athens †	71	19	43.8	4.64	Grainfield *3	68		23.9	1.10
Bainbridge †				7.69	Kentucky.				
Canton †				4.89	Burnside †				5.07
Columbus †	75	24	52.6	7.81	Missouri.				
Cordele †	74	24	49.0	5.72	Cape Girardeau †				1.00
Dublin †				7.34	Texas.				
Fort Gaines †	75	25	54.0	9.75	Albany *†	70	22	41.9	0.15
Griffin †	65	13	35.4	7.00	Austin †	77	23	48.4	0.60
Macon †				7.68	College Station	76	22	47.4	2.07
Millen †	77	22	51.1	6.85	Eastland *†	69	16	36.9	0.20
Resaca †				4.65	Graham †	70	13	39.5	0.74
Reynolds †				8.02	Llano *†	83	20	45.4	0.70
Thomasville †	78	28	55.4	10.07	Round Rock †	80	18	47.6	1.33
West Point †	70	22	48.1	8.72					

Received too late for publication in January, 1894.

Arkansas.					Minnesota.				
Helena †	72	6	45.4	4.84	Long Prairie †	45	-38	4.2	0.43
California.					Missouri.				
Calloway †				0.82	Cape Girardeau †				1.50
Davisville †	78	30	52.0	6.34	Nevada.				
Julian †				4.40	Elko (near)	51	-27	24.2	2.75
Kernville				1.10	New Hampshire.				
Pleasanton †	60	20	42.8	4.31	Mine Falls				2.66
Point George L. H.				8.96	Pennichuck Station				2.20
Upper Lake	67	20	41.6	10.43	New Mexico.				
Colorado.					Fort Bayard	65	21	35.5	0.00
Lamar †	73	-6	32.3	0.00	Ohio.				
Leslie				0.02	Canton †	60	3	33.5	1.61
Longmont †	60	-19	22.7	0.73	South Dakota.				
Loveland				0.13	Aberdeen †				0.40
Manhattan				0.42	Texas.				
Springfield †				0.02	Albany *†	74	18	45.6	1.11
Steamboat Springs †	36	-30	13.6	5.50	Corsicana †	79	5	48.8	1.81
Georgia.					Estella †	80	3	46.9	1.80
Albany †	76	30	52.3		Hartley †	72	-3	31.9	0.10
Gillsville *†	69	28	46.7	4.58	Virginia.				
Talbotton †	75	26	48.6	3.97	Charlottesville	61	16	40.8	2.15
Iowa.					Washington.				
Fayette	55	-27	17.6	1.08	Davenport †	42	-4	23.2	1.66
Kansas.					Wenatchee Lake †	42	-4	15.2	3.85
Lawrence †	68	-14	30.0	1.00	Mexico.				
Michigan.					Leon de Aldamas	73	38	58.3	0.04
Grande Pointe au					Mexico	71	39	55.8	0.04
Sable *†	48	8	26.0		Puebla	68	43	56.5	0.01

EXPLANATION OF SIGNS.

*Extremes of temperature from observed readings of dry thermometer.
† Weather Bureau instruments.
A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:
1 Mean of 7 a. m. + 2 p. m. + 9 p. m. + 4.
2 Mean of 8 a. m. + 8 p. m. + 2.
3 Mean of 7 a. m. + 7 p. m. + 2.
4 Mean of 6 a. m. + 6 p. m. + 2.
5 Mean of 7 a. m. + 2 p. m. + 2.
6 Mean from readings at various hours reduced to true daily mean by special tables.
7 Mean from hourly readings of thermograph.
8 Mean of 7 a. m. + 2 p. m. + 9 p. m. + 3.
9 Mean of sunrise and noon.
10 Mean of sunrise, noon, sunset, and midnight.
The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.
An Italic letter following the name of a station, as "Livingston a," "Livingston b," indicates that two or more observers, as the case may be, are reporting from the same station. A small Roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "a" denotes 14 days missing.
No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.
Corrections: California, Oakdale a, January, 1894, make mean temperature 41.9 instead of 38.4. Georgia, Clayton, January, 1894, add precipitation 5.70 inches; Alapaha, January, 1894, make precipitation 1.18 instead of 1.00.
NOTE.—The following changes have been made in names of stations: Arizona, Navajo Springs, changed to Navajo. Illinois, Muddy Valley, changed to Halliday. Nevada, Monitors Ranch, changed to McGill.

TABLE III.—Data from Canadian stations for the month of February, 1894.

Station.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.	
	Inches.	Inches.	Inches.	°	°	Inches.	Inches.	
Saint John's, N. F.	29.72	29.87	+ .05	19.2	- 3.0	11.84	- 1.60	s.
Sydney, N. S.	29.94	30.00	+ .05	15.5	- 3.0	2.59		nw.
Grindstone, G. S. L.								
Sandy Point, N. F.								
Halifax, N. S.	29.92	30.06	+ .08	18.8	- 2.2	3.46	- 1.24	n.
Grand Manan, N. B.	30.01	30.06		21.9		1.87	- 1.69	nw.
Yarmouth, N. S.	29.98	30.06	+ .02	23.8	- 1.7	2.28	- 3.54	n.
Saint Andrews, N. B.	29.98	30.03		17.2		2.55	- 1.21	nw.
Charlottetown, P. E. I.	29.96	30.00		13.2		2.34	- 1.36	w.
Chatham, N. B.	30.02	30.04	+ .06	6.2	- 3.3	1.36	- 1.35	w.
Father Point, Que.	30.01	30.04	+ .04	8.0	- 2.0	0.67	- 0.95	w.
Quebec, Que.	29.74	30.10	+ .06	8.6	- 1.4	2.62	- 1.37	w.
Montreal, Que.	29.88	30.11	+ .06	12.0	- 1.0	1.03	- 1.79	sw.
Rockliffe, Ont.	29.54	30.10	+ .04	4.6	- 1.9	0.70	- 1.62	e.
Kingston, Ont.	29.78	30.12	+ .04	15.8	- 0.7	1.41	- 1.03	no.
Toronto, Ont.	29.72	30.13	+ .04	19.5	- 1.0	2.24	- 0.07	w.
White River, Ont.	28.64	30.12		- 1.6	- 0.1	0.14	- 1.08	w.
Port Stanley, Ont.	29.44	30.12	+ .03	20.8		3.23	+ 0.31	w.
Saugeen, Ont.	29.32	30.08	+ .02	18.4	+ 0.9	2.73	+ 0.29	s.
Parry Sound, Ont.	29.34	30.09	+ .02	12.7	+ 0.7	2.92	+ 0.52	w.
Port Arthur, Ont.	29.29	30.05	- .04	5.8	+ 0.3	0.04	- 1.29	w.
Winnipeg, Man.	29.16	30.07	- .09	1.6	+ 6.6	1.00	- 0.17	s.
Minnedosa, Man.	28.07	30.04	- .11	- 0.1	+ 5.9	0.77	- 0.21	nw.
Qu'Appelle, Assiniboia	27.61	30.07	- .07	2.2	+ 4.7	0.66	- 0.01	nw.
Medicine Hat, Assiniboia	27.60	30.05	- .09	14.2	+ 3.7	0.92	+ 0.48	sw.
Swift Current, Assiniboia	27.32	30.09	- .05	8.4	+ 2.4	0.50	- 0.26	nw.
Calgary, Alberta	26.26	30.02	- .07	14.6	+ 5.1	0.03	- 0.73	w.
Prince Albert, Sask.	28.38	30.03		1.6		0.47		nw.
Edmonton, Alberta	27.53	30.03	- .07	10.5	+ 3.9	T.	- 0.46	nw.
Battleford, Saskatchewan	28.14	30.03		2.8		0.14		se.
Spences Bridge, B. C.	29.15	30.02		26.2		0.25		e.
Sable Island.								
Hamilton, Bermuda	30.06	30.22	+ .11	62.0		3.19		s.
December, 1893.								
Father Point, Que.	29.99	30.02	+ .07	10.5	- 5.5	4.54	+ 2.32	nw.
January, 1894.								
Saint John's, N. F.	29.72	29.87	+ .03	22.0	- 1.6	6.77		n.

TABLE IV.—Hourly sunshine as deduced from sunshine recorders, February, 1894.

Stations.	Instrument.	Percentage for each hour of local mean time ending with the respective hour.																Monthly summary.			
		A. M.								P. M.								Instrumental record.			
		5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	Actual.	Possible.	Per cent of possible.	Personal estimate.
Baltimore, Md.	T.			20	20	38	59	69	75	75	72	67	65	57	42			Hours.	Hours.		
Boston, Mass.	T.			37	41	42	57	58	64	67	66	60	49	40	41			174.9	299.7	58	45
Buffalo, N. Y.	T.			22	23	29	48	61	65	66	67	60	47	32	30			159.0	295.1	54	41
Chicago, Ill.	T.			45	50	51	56	61	64	64	61	60	61	52	49			144.1	295.1	48	39
Cincinnati, Ohio	P.			31	40	43	49	51	54	51	51	50	45	43	40			170.6	295.5	57	50
Cleveland, Ohio.	P.																	141.1	300.3	47	44
Colorado Springs, Colo. *	T.			30	34	37	49	51	46	45	40	44	41	37	36			125.1	297.1	42	32
Columbus, Ohio	T.			34	44	60	78	86	88	87	79	75	65	43	36			117.6	174.1	68	54
Denver, Colo.	P.			34	40	41	57	56	66	69	67	58	54	41	40			161.2	301.2	54	36
Des Moines, Iowa	T.			56	57	68	80	88	91	83	82	76	74	57	57			222.9	300.0	75	54
	P.			45	50	59	65	72	80	84	87	82	77	54	54			208.4	296.6	70	61
Detroit, Mich.	T.			44	45	49	59	69	66	69	74	68	58	46	42			175.7	294.8	59	45
Dodge City, Kans.	P.			46	57	64	68	73	74	72	75	70	65	58	51			200.6	303.3	66	54
Eastport, Me.	P.			42	43	45	51	55	56	52	53	56	56	43	40			148.0	292.1	50	42
Galveston, Tex.	P.			20	21	32	40	38	44	47	49	46	42	30	20			117.2	312.9	38	38
Kansas City, Mo.	P.			43	44	49	60	63	64	61	64	64	58	44	44			169.0	300.0	56	43
Key West, Fla.	T.			73	77	79	83	87	90	92	92	89	81	79	73			264.3	316.1	84	66
Little Rock, Ark.	T.			35	33	35	43	49	60	63	58	56	51	44	35			147.1	305.8	48	41
Louisville, Ky.	T.			26	33	51	66	65	62	67	69	51	27	23	23			149.0	300.9	49	40
Memphis, Tenn.	P.			30	33	34	36	39	42	42	44	45	45	36	34			119.5	305.2	39	34
New Haven, Conn.	T.			36	36	45	59	62	60	64	64	62	48	36	34			156.3	298.4	52	46
New Orleans, La.	T.			13	16	26	34	42	46	46	45	48	41	27	20			109.8	312.7	35	33
New York, N. Y. †	T.			28	30	38	44	50	52	62	55	52	40	30	30			95.5	216.3	44	38
Philadelphia, Pa.	T.			31	45	45	54	60	61	64	65	56	57	45	44			163.0	300.0	54	37
Portland, Me.	T.			40	41	50	65	78	83	88	89	87	69	42	40			199.3	294.6	67	42
Portland, Oreg.	P.			5	9	19	26	28	33	24	26	26	28	14	10			66.0	292.1	23	24
Rochester, N. Y.	T.			23	27	27	53	59	66	72	71	68	46	27	27			148.4	295.0	50	50
Saint Louis, Mo.	T.			57	58	59	67	77	78	71	70	63	57	54	40			192.1	301.6	63	56
Salt Lake City, Utah.	T.			31	31	31	48	70	74	84	80	70	59	32	28			167.1	297.2	56	43
San Diego, Cal.	P.			64	71	75	76	86	81	84	87	89	89	77	75			248.9	307.6	81	61
San Francisco, Cal.	P.			26	32	49	61	64	59	55	61	62	65	52	30			163.1	302.3	54	51
Santa Fe, N. Mex.	P.			40	50	64	73	72	74	73	80	72	61	57	48			200.0	304.5	66	53
Savannah, Ga.	P.			37	38	46	44	47	44	41	54	55	49	38	35			138.8	307.5	45	38
Tucson, Ariz.	P.			63	68	83	88	88	90	92	93	90	83	64	57			253.5	308.3	82	64
Vicksburg, Miss.	T.			26	26	34	41	48	51	57	51	47	47	46	29			81.7	186.5	44	41
Washington, D. C.	P.			28	25	40	50	58	53	54	62	59	60	55	49			154.4	300.6	51	46
Wilmington, N. C.	T.			25	26	32	55	58	60	65	64	52	46	28	25			142.3	304.5	47	36

* Instrumental record for 16 days.

† For 20 days.

‡ For 17 days.

The personal estimates are all for the whole month.

TABLE V.—Mean temperature for each hour of seventy-fifth meridian time, February, 1894.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	37.4	36.8	36.3	35.6	34.9	34.2	34.0	33.6	33.2	34.4	37.4	40.0	42.2	44.6	46.4	47.8	48.7	48.0	46.5	44.7	42.2	40.7	39.6	38.6	39.9
Albany, N. Y.	20.6	20.0	19.5	19.4	19.2	18.6	18.2	18.2	18.9	20.5	21.9	23.3	24.6	25.3	25.8	25.6	25.0	24.2	23.5	22.6	22.4	21.9	21.7	21.2	21.8
Alpena, Mich.	16.6	16.1	15.2	14.8	14.0	13.6	13.6	14.4	15.7	16.8	18.5	20.2	21.7	23.2	24.6	25.2	24.9	23.4	21.9	20.9	19.9	19.1	18.4	17.9	18.8
Amarillo, Tex.	26.1	25.5	24.8	23.9	23.1	22.5	21.9	21.6	21.3	23.5	26.0	28.5	31.0	33.0	34.7	35.8	36.6	36.7	36.0	33.9	31.3	29.5	28.4	27.2	28.5
Atlanta, Ga.	43.6	43.0	42.4	42.0	41.8	41.9	41.8	41.2	41.8	42.5	43.9	45.5	46.9	48.4	49.0	49.3	49.1	48.8	48.0	47.0	46.1	45.4	44.2	43.8	44.9
Augusta, Ga.	48.2	47.3	47.0	46.8	46.2	46.0	45.6	44.9	45.9	47.8	50.1	52.0	53.5	54.8	55.9	56.1	56.1	55.5	54.3	52.0	51.2	50.4	49.4	48.6	52.4
Baker City, Oreg.	30.1	19.2	18.8	18.2	18.0	17.9	17.2	16.9	17.0	16.6	17.8	20.1	23.1	24.9	26.7	27.4	27.5	27.4	27.5	25.6	23.8	22.8	22.0	21.4	21.6
Baltimore, Md.	32.9	32.4	31.6	31.1	30.9	30.9	30.7	31.1	31.5	32.7	33.9	35.5	36.5	37.8	38.1	38.2	37.6	36.8	35.9	34.6	34.1	33.6	33.2	33.0	34.0
Boston, Mass.	24.7	24.5	24.2	23.9	23.6	23.3	23.4	24.1	25.0	26.2	27.6	29.2	30.4	30.5	31.0	30.6	29.9	29.1	28.4	27.9	27.3	26.8	26.1	25.7	26.8
Buffalo, N. Y.	22.6	22.4	22.4	22.4	22.0	21.6	21.4	21.6	22.5	23.2	23.9	25.1	25.6	25.5	25.9	26.4	26.1	25.8	25.3	24.9	24.7	24.5	24.0	23.7	23.9
Charleston, S. C.	50.8	50.1	50.4	49.8	49.1	49.0	48.7	48.8	50.0	52.2	54.0	54.8	56.0	56.4	56.6	56.3	55.8	53.9	52.7	52.2	51.9	51.9	51.6	51.4	52.3
Charlotte, N. C.	43.4	42.6	41.6	41.0	40.5	39.9	39.1	39.1	40.2	42.4	44.7	46.9	48.7	50.1	51.3	51.8	51.3	49.9	48.5	47.2	46.4	45.6	44.6	43.7	45.0
Cheyenne, Wyo.	16.2	15.5	15.0	14.9	14.7	15.0	14.7	14.9	15.0	15.2	16.5	18.5	20.2	21.7	23.2	24.6	25.2	24.9	23.4	21.9	20.9	19.9	19.1	18.4	17.9
Chicago, Ill.	22.0	21.5	21.2	20.8	20.6	19.8	19.6	19.8	20.5	21.4	22.6	23.8	24.9	25.9	26.8	27.1	27.2	26.6	25.9	25.3	24.4	23.9	23.4	23.0	23.3
Cincinnati, Ohio	31.9	31.4	30.6	30.2	29.4	29.1	28.7	28.5	28.8	30.0	31.7	33.6	35.3	36.2	37.2	37.8	37.9	37.4	36.6	35.8	34.9	34.0	33.0	32.5	33.0
Cleveland, Ohio	26.0	25.3	24.7	24.1	23.8	23.5	23.0	22.6	23.0	24.2	25.4	26.8	27.8	28.6	29.0	29.6	29.6	29.2	28.8	28.2	28.0	27.9	27.4	27.0	26.4
Colorado Springs, Colo.	17.8	17.7	17.4	17.5	17.4	16.9	16.1	15.3	14.7	17.4	22.9	27.2	29.3	30.9	31.0	31.9	31.8	31.4	29.3	26.2	23.7	21.4	20.3	19.4	22.7
Columbus, Ohio	27.7	27.0	26.6	26.2	25.8	25.3	25.0	25.1	26.0	27.5	29.2	30.7	32.3	33.1	34.0	34.5	34.5	33.8	32.7	32.1	31.1	30.6	29.7	29.0	29.6
Denver, Colo.	21.3	20.2	19.6	19.3	18.8	18.1	17.7	16.8	16.6	17.4	20.7	25.2	28.7	32.2	33.7	34.4	35.0	34.4	32.9	30.9	29.0	27.1	24.8	23.4	24.9
Des Moines, Iowa	18.5	17.9	17.2	16.4	15.6	14.9	14.4	14.1	14.2	16.2	19.0	21.6	23.6	25.7	27.1	28.3	28.9	28.6	27.4	24.8	23.0	22.3	21.8	20.2	20.9
Detroit, Mich.	22.1	21.9	21.5	21.1	20.6	20.2	19.8	19.6	20.1	21.4	23.2	24.8	25.7	26.8	27.4	27.8	27.8	27.1	26.4	25.7	25.1	24.7	24.0	23.4	23.7
Dodge City, Kans.	20.4	20.0	19.5	18.8	17.9	17.5	17.0	16.6	16.4	18.1	22.1	25.0	28.4	30.1	31.7	32.8	33.0	32.5	31.0	27.8	26.0	24.9	23.2	22.2	23.9
Duluth, Minn.	12.6	12.0	11.1	10.5	9.5	8.9	8.2	7.6	7.8	8.6	10.3	12.9	15.7	17.5	19.1	20.4	20.8	20.3	19.3	18.5	17.4	16.5	15.6	14.8	14.0
Eastport, Me.	18.2	17.9	17.4	17.5	17.1	16.8	16.7	17.1	18.0	19.6	20.9	22.1	22.8	23.6	23.9	23.6	23.0	22.0	21.4	21.1	20.8	19.9	19.5	19.2	20.0
El Paso, Tex.	43.8	42.1	40.8	39.1	37.9	36.0	34.1	33.6	32.9	34.9	38.9	43.1	46.3	49.4	51.8	53.3	54.8	54.9	55.0	52.8	50.7	49.4	47.0	44.6	44.4
Fort Smith, Ark.	37.0	36.3	36.0	35.6	35.1	34.8	34.3	34.4	34.2	35.5	37.3	39.9	42.5	45.0	46.6	47.5	47.5	47.0	45.2	43.3	42.1	40.6	39.9	38.7	39.8
Galveston, Tex.	52.7	52.4	52.1	51.8	51.3	50.9	50.8	51.1	51.6	52.5	53.6	54.5	55.3	55.8	56.1	56.1	55.9	54.9	54.2	54.0	53.3	53.0	52.6	52.3	53.2
Grand Haven, Mich.	23.1	22.8	22.8	22.1	21.5	21.2	21.0	20.4	20.2	21.6	23.3	24.5	25.5	26.8	28.1	28.6	28.1	27.5	26.2	24.9	24.5	24.2	23.9	23.5	23.6
Havre, Mont.	12.5	12.3	11.6	11.4	11.9	11.5	11.3	10.6	10.3	11.0	13.1	15.4	17.6	19.8	21.6	22.9	23.4	23.0	21.5	19.0	17.4	16.4	15.0	14.0	15.6
Helena, Mont.	15.0	14.2	13.9	13.7	13.1	12.5	12.1	11.5	11.5	13.5	15.8	18.6	21.6	23.7	25.8	27.9	29.9	31.2	32.0	28.8	26.0	24.7	23.7	22.2	23.9
Huron, S. Dak.	6.5	6.2	5.9	5.3	5.1	4.8	3.8	3.4	3.1	4.2	7.4	10.5	13.0	14.9	17.0	18.6	18.5	17.8	16.0	14.0	12.7	11.3	10.2	9.1	10.0
Indianapolis, Ind.	27.9	27.2	26.6	26.3	25.6	25.1	24.9	24.6	25.9	27.8	29.6	31.1	32.0	33.7	34.5	34.7	34.5	33.6	32.3	31.2	30.5	30.0	29.8	29.5	29.5
Jacksonville, Fla.	55.9	55.2	54.9	54.2	53.7	53.4	53.1	53.8	55.9	58.1	60.0	61.5	62.7	64.0	64.5	64.6	63.7	62.2	60.6	59.5	58.6	57.8	57.3	56.6	58.4
Kansas City, Mo.	25.1	24.3	23.8	23.4	23.0	22.9	22.2	22.2	23.5	25.0	26.8	28.2	29.4	30.9	31.6	31.8	31.5	30.6	29.8	28.9	27.9	27.7	26.8	26.3	26.6
Key West, Fla.	69.9	69.9	69.9	70.0	69.7	69.7	70.5	72.3	73.4	74.5	75.3	75.6	75.6	75.4	75.0	74.3	73.3	71.8	70.3	71.1	70.8	70.5	70.2	72.1	72.1
Knoxville, Tenn.	39.1	38.6	38.0	37.6	37.2	36.4	35.9	35.8	36.1	37.7	39.3	41.1	42.5	43.9	44.7	45.5	45.6	44.8	43.9	43.2	42.1	41.1	40.2	39.7	40.4
Lander, Wyo.	8.6	7.8	6.8	6.0	5.1	4.7	4.0	3.2	2.7	6.1	12.5	16.7	21.1	24.2	25.8	26.7	26.1	24.2	20.4	16.8	13.5	12.3	11.0	9.9	13.2
Little Rock, Ark.	40.2	39.4	38.6	38.0	37.2	36.8	36.3	36.0	36.0	37.1	39.0	40.6	41.9	43.5	45.0	45.9	46.5	45.4	44.6	43.5	42.4	41.5	40.8	40.4	41.0
Louisville, Ky.	34.1	33.5	33.0	32.3	31.5	31.0	30.6	30.8	31.1	32.1	34.0	35.1	37.5	38.9	40.2	41.1	40.5	39.6	38.1	37.3	36.6	36.0	35.4	34.8	35.3
Lynchburg, Va.	36.8	36.3	36.2	35.6	35.2	34.8	34.5	34.6	36.0	38.1	41.2	42.8	44.3	45.2	46.2	45.6	45.2	44.0	42.1	40.5	39.1	38.4	37.5	36.9	39.4
Marquette, Mich.	15.8	15.3	14.7	14.1	13.4	12.8	12.3	12.0	12.7	13.9	16.0	17.9	19.3	20.4	21.1	21.5	21.1	20.7	19.7	18.9	18.0	17.8	17.5	16.9	16.8
Memphis, Tenn.	39.8	39.5	38.8	38.2	37.8	37.2	36.5	36.5	36.8	37.9	39.2	40.4	41.8	42.9	44.1	44.5	44.9	44.1	43.8	43.0	42.1	41.4	40.8	40.3	40.5
Milwaukee, Wis.	19.9	19.3	19.0	18.0	17.5	17.2	16.7	17.2	17.9	21.6	23.8	26.5	29.2	31.7	34.0	36.2	37.2	37.6	36.1	34.7	33.2	32.2	31.9	31.2	31.8
Montgomery, Ala.	48.2	47.9	46.9	46.7	46.4	46.1	45.2	45.3	46.1	47.9	50.1	52.0	53.5	54.8	55.9	56.0	56.2	55.4	54.2	53.3	52.3	51.2	49.7	48.7	50.4
Moorehead, Minn.	7.4	6.4	6.1	5.7	5.0	4.0	3.5	3.3	3.6	4.5	6.7	9.3	11.2	13.3	14.8	15.8	16.1	15.6	14.2	13.2	12.2	11.1	10.2	9.4	9.3
Nantucket, Mass.	29.2	29.2	29.4	29.4	29.3	29.0	29.3	30.2	30.7	31.0	31.6	32.1	32.1	31.9	32.0	31.4	30.1	29.7	29.6	30.1	29.8	29.8	29.5	29.5	30.3
Nashville, Tenn.	38.0	37.5	36.7	36.1	35.5	35.0	34.8	34.6	35.0	35.9	37.4	39.7	41.6	42.6	43.5	44.0	44.0	43.4	42.4	41.5	40.4	39.8	39.1	38.4	39.0
New Haven, Conn.	23.7	23.2	22.8	22.8	22.5	22.1	21.9	22.6	24.2	26.2	28.0	29.8	30.9	32.0	32.9	33.0	32.5	31.8	30.6	29.2	27.5	26.2	25.2	24.4	26.1
New Orleans, La.	52.9	52.7	52.2	51.7	51.2	50.9	50.6	50.7	50.9	52.0	53.2	54.9	55.5	56.6	57.0	57.4	57.6	56.6	55.9	55.1	54.4	53.8	53.2	53.9	53.9
New York, N. Y.	28.2	28.0	28.1	27.8	27.5	27.1	26.9	27.3	27.8	28.9	29.6	30.8	31.9	32.6	33.1	32.7	32.3	31.5	30.6	30.2	29.6	29.1	28.6	28.6	

TABLE VI.—Mean pressure for each hour of seventy-fifth meridian time, February, 1894.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.....	28.331	.222	.320	.318	.311	.311	.316	.325	.335	.344	.351	.354	.343	.323	.297	.279	.272	.270	.275	.286	.301	.316	.326	.326	.315
Albany, N. Y.....	30.061	.058	.053	.049	.054	.058	.069	.078	.082	.082	.081	.068	.048	.035	.034	.040	.048	.060	.067	.071	.071	.073	.071	.069	.062
Alpena, Mich.....	29.381	.382	.385	.386	.390	.392	.402	.404	.409	.404	.400	.396	.379	.363	.351	.352	.354	.355	.361	.362	.371	.376	.376	.375	.379
Atlanta, Ga.....	28.948	.947	.948	.946	.945	.956	.959	.970	.994	.002	.003	.994	.975	.954	.938	.932	.934	.940	.946	.949	.947	.956	.956	.953	.958
Augusta, Ga.....	29.970	.969	.965	.958	.963	.972	.981	.990	.994	.004	.003	.997	.977	.952	.939	.934	.935	.943	.952	.959	.964	.968	.971	.974	.974
Baltimore, Md.....	29.934	.927	.920	.913	.914	.924	.931	.944	.954	.958	.957	.943	.924	.912	.911	.912	.925	.938	.950	.949	.957	.959	.952	.946	.936
Bismarck, N. Dak.....	28.214	.211	.208	.209	.205	.207	.208	.209	.215	.218	.220	.216	.214	.206	.187	.176	.178	.183	.186	.195	.196	.199	.200	.197	.202
Boston, Mass.....	29.983	.982	.975	.974	.976	.983	.992	.998	.993	.989	.986	.961	.941	.936	.940	.948	.963	.974	.983	.987	.990	.990	.988	.991	.976
Buffalo, N. Y.....	29.327	.322	.317	.317	.321	.328	.341	.352	.361	.367	.370	.363	.350	.338	.335	.333	.339	.342	.344	.343	.341	.339	.336	.333	.340
Chicago, Ill.....	29.202	.202	.203	.200	.198	.204	.209	.214	.223	.224	.221	.219	.203	.181	.165	.166	.167	.175	.185	.189	.191	.196	.198	.197	.197
Cincinnati, Ohio.....	29.448	.448	.451	.454	.458	.470	.479	.489	.501	.501	.494	.482	.463	.442	.428	.424	.423	.429	.438	.448	.450	.455	.453	.450	.457
Cleveland, Ohio.....	29.283	.282	.281	.282	.290	.299	.309	.315	.325	.325	.327	.320	.302	.284	.273	.269	.272	.274	.285	.284	.283	.285	.284	.284	.292
Colorado Sp'gs, Colo.....	23.912	.940	.939	.940	.936	.935	.940	.945	.952	.958	.958	.956	.950	.936	.915	.899	.888	.891	.904	.922	.932	.936	.938	.940	.933
Columbus, Ohio.....	29.175	.175	.176	.179	.188	.198	.209	.220	.223	.228	.227	.217	.200	.176	.163	.155	.157	.169	.176	.180	.180	.182	.186	.181	.188
Davenport, Iowa.....	29.335	.339	.341	.335	.338	.339	.341	.342	.340	.333	.339	.316	.291	.275	.265	.263	.268	.276	.288	.295	.297	.298	.304	.310	.311
Denver, Colo.....	24.716	.714	.711	.706	.704	.701	.704	.706	.709	.714	.717	.720	.718	.705	.684	.666	.658	.658	.663	.678	.691	.702	.709	.713	.699
Des Moines, Iowa.....	29.212	.210	.209	.205	.200	.199	.201	.199	.202	.204	.205	.204	.195	.179	.166	.164	.164	.166	.180	.188	.188	.191	.196	.199	.193
Detroit, Mich.....	29.289	.289	.289	.288	.291	.301	.306	.319	.328	.327	.328	.322	.308	.289	.277	.272	.274	.278	.287	.291	.290	.290	.288	.287	.296
Dodge City, Kans.....	27.463	.458	.452	.447	.438	.435	.441	.451	.470	.482	.494	.500	.499	.483	.458	.443	.438	.438	.440	.445	.448	.451	.454	.454	.458
Duluth, Minn.....	29.335	.339	.341	.335	.338	.339	.341	.342	.340	.333	.339	.316	.291	.275	.265	.263	.268	.276	.288	.295	.297	.298	.304	.310	.311
Eastport, Me.....	29.953	.954	.957	.959	.965	.971	.989	.002	.005	.001	.985	.966	.945	.935	.930	.931	.935	.944	.954	.959	.965	.964	.963	.964	.962
El Paso, Tex.....	26.232	.234	.234	.236	.235	.236	.245	.255	.266	.282	.292	.294	.286	.265	.235	.210	.195	.190	.188	.195	.205	.218	.226	.231	.237
Galveston, Tex.....	30.128	.126	.121	.114	.113	.113	.124	.134	.144	.161	.168	.170	.152	.116	.097	.085	.081	.086	.094	.109	.117	.127	.129	.129	.122
Grand Haven, Mich.....	29.381	.385	.387	.386	.385	.383	.385	.393	.401	.400	.397	.396	.383	.363	.349	.343	.346	.347	.355	.364	.363	.364	.367	.374	.401
Havre, Mont.....	27.356	.359	.354	.349	.342	.337	.332	.329	.332	.341	.333	.316	.291	.275	.265	.263	.268	.276	.288	.295	.297	.298	.304	.310	.311
Helena, Mont.....	25.790	.790	.790	.790	.793	.789	.790	.790	.790	.792	.796	.794	.785	.779	.761	.749	.742	.744	.750	.754	.762	.770	.777	.782	.777
Huron, S. Dak.....	28.685	.682	.680	.678	.671	.671	.674	.671	.672	.676	.680	.685	.681	.669	.652	.645	.644	.643	.649	.659	.660	.660	.663	.666	.667
Indianapolis, Ind.....	29.283	.286	.292	.301	.304	.313	.322	.327	.333	.339	.330	.323	.308	.289	.277	.272	.274	.278	.287	.291	.290	.290	.288	.287	.296
Jacksonville, Fla.....	30.129	.125	.118	.116	.120	.128	.141	.151	.159	.166	.163	.148	.119	.096	.086	.086	.086	.097	.114	.125	.132	.136	.134	.130	.125
Kansas City, Mo.....	29.133	.131	.128	.123	.114	.109	.113	.117	.125	.133	.139	.144	.138	.119	.092	.084	.093	.093	.106	.116	.121	.131	.131	.131	.119
Keeler, Cal.....	29.174	.165	.150	.144	.143	.148	.162	.177	.189	.199	.200	.185	.167	.149	.133	.122	.124	.131	.143	.160	.171	.175	.177	.173	.161
Key West, Fla.....	30.088	.087	.086	.084	.087	.098	.107	.114	.120	.124	.128	.123	.107	.082	.054	.054	.057	.067	.074	.081	.084	.094	.097	.096	.092
Knoxville, Tenn.....	29.838	.837	.837	.834	.826	.830	.839	.847	.852	.866	.875	.875	.858	.831	.811	.795	.793	.792	.809	.816	.828	.834	.840	.841	.833
Little Rock, Ark.....	29.564	.564	.569	.570	.571	.574	.583	.601	.608	.607	.608	.604	.579	.555	.541	.534	.535	.540	.558	.561	.565	.566	.568	.570	.570
Lynchburg, Va.....	29.384	.382	.376	.376	.381	.389	.404	.412	.416	.419	.417	.406	.384	.367	.360	.361	.370	.380	.394	.396	.399	.398	.395	.392	.390
Marquette, Mich.....	29.212	.213	.220	.217	.220	.225	.231	.231	.232	.235	.238	.234	.214	.196	.182	.180	.179	.180	.187	.191	.193	.194	.198	.200	.208
Memphis, Tenn.....	29.812	.806	.804	.797	.802	.811	.816	.832	.839	.846	.848	.832	.799	.785	.779	.776	.779	.780	.800	.802	.809	.809	.810	.810	.810
Milwaukee, Wis.....	29.348	.356	.365	.368	.372	.378	.382	.379	.384	.384	.380	.373	.359	.339	.322	.315	.305	.313	.328	.339	.339	.332	.336	.335	.350
Moorehead, Minn.....	29.031	.029	.028	.029	.026	.028	.029	.026	.023	.028	.035	.035	.033	.021	.009	.005	.002	.010	.017	.021	.020	.018	.011	.010	.021
Nantucket, Mass.....	30.109	.107	.102	.101	.102	.102	.111	.113	.112	.108	.106	.086	.070	.062	.061	.066	.075	.092	.106	.116	.120	.121	.123	.119	.100
Nashville, Tenn.....	29.549	.553	.557	.556	.556	.564	.571	.576	.582	.585	.584	.572	.545	.525	.514	.508	.511	.514	.529	.538	.542	.549	.550	.554	.575
New Haven, Conn.....	30.009	.008	.008	.009	.009	.005	.012	.010	.014	.009	.005	.004	.974	.962	.962	.970	.983	.998	.010	.015	.019	.016	.017	.017	.000
New Orleans, La.....	30.103	.096	.091	.089	.088	.096	.106	.117	.128	.135	.138	.132	.111	.092	.075	.057	.068	.075	.081	.094	.106	.112	.112	.108	.101
New York, N. Y.....	29.945	.939	.931	.921	.922	.928	.935	.943	.945	.948	.946	.934	.918	.899	.879	.861	.845	.825	.807	.785	.762	.739	.715	.690	.665
Norfolk, Va.....	30.066	.058	.051	.049	.058	.068	.082	.094	.103	.107	.106	.097	.075	.062	.055	.053	.058	.072	.084	.090	.088	.089	.083	.076	.076
Olympia, Wash.....	28.965	.961	.959	.955	.951	.949	.952	.955	.959	.960	.964	.965	.961	.946	.928	.919	.923	.931	.936	.942	.944	.945	.950	.951	.949
Omaha, Neb.....	30.019	.012	.006	.009	.001	.004	.013	.023	.032	.035	.036	.024	.007	.995	.991	.996	.003	.016	.028	.035	.037	.035	.035	.031	.017
Philadelphia, Pa.....	17.452	.451	.445	.435	.429	.421	.424	.436	.445	.456	.468	.476	.480	.474	.463	.455	.457	.458	.456	.459	.462	.463	.461	.461	.454
Pikes Peak, Colo.....	29.209	.207	.205	.203	.207	.215	.227	.243	.245	.248	.252	.247	.232	.212	.206	.205	.207	.211	.216	.221	.223	.220	.217	.215	.221
Pittsburg, Pa.....	29.921	.921	.923	.922	.929	.927	.926	.928	.934	.939	.948	.951	.956	.947	.936	.922	.919	.913	.911	.910	.909	.905	.907	.906	.926
Portland, Ore.....	29.547	.546	.541	.535	.535	.540	.549	.555	.575	.582	.585	.584	.562	.548	.542	.543	.548	.553	.560	.560	.560	.556	.555	.555	.555
Rochester, N. Y.....	29.545	.546	.546	.546	.547	.547	.546	.548	.550	.550	.555	.561	.567	.565	.563	.550	.539	.528	.526	.522	.522	.528	.532	.534	.544
Roseburg, Ore.....	29.540	.537	.538	.530	.532	.534	.539	.545	.552	.555	.556	.550	.533	.517	.497	.491	.489	.492	.504	.515	.521	.522	.529	.534	.547
St. Louis, Mo.....	29.180	.177	.178	.177	.170	.169	.167	.165	.169	.175	.175	.176	.163	.148	.135	.130	.131	.137	.143	.150	.155	.159	.160	.164	.161
St. Paul, Minn.....	25.718	.719	.718	.716	.713	.705	.705	.706	.709	.718	.729	.739	.739												

TABLE VII.—Average wind movement for each hour of seventy-fifth meridian time, February, 1894.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	10.8	10.5	11.5	11.6	11.1	11.5	11.3	10.9	10.9	12.0	14.0	15.2	16.7	16.1	15.2	14.5	15.0	14.6	13.1	10.8	9.6	9.8	10.2	9.9	12.4
Albany, N. Y.	7.9	7.0	7.7	8.6	8.1	7.3	7.2	8.1	8.8	9.3	10.4	11.3	11.8	11.7	12.1	12.0	10.9	9.8	8.8	8.2	8.3	8.0	8.1	8.3	9.2
Alpena, Mich.	10.8	10.2	10.7	10.4	10.3	10.6	10.2	9.8	10.5	11.0	12.5	13.0	13.1	13.0	13.6	13.8	13.6	12.9	11.6	12.3	11.9	11.9	11.9	10.9	11.7
Amarillo, Tex.	17.0	16.9	16.9	17.1	16.4	16.1	15.2	16.4	16.4	16.0	17.8	18.9	19.9	20.5	20.3	20.1	18.5	18.4	17.9	16.7	16.5	16.4	17.4	17.7	17.6
Atlanta, Ga.	11.7	12.2	11.8	12.0	12.9	13.0	12.1	12.1	12.9	13.5	13.8	13.3	13.5	13.7	14.0	13.8	13.1	12.1	10.9	10.6	11.8	12.1	12.0	12.1	12.5
Atlantic City, N. J.	14.5	14.3	14.5	14.8	14.5	14.8	14.2	14.7	14.1	14.4	14.8	14.4	14.6	15.2	15.1	16.2	15.6	14.1	13.4	13.6	12.9	12.4	13.1	13.7	14.3
Augusta, Ga.	6.9	6.8	6.6	6.1	6.0	5.8	6.5	6.4	6.7	7.4	8.9	9.2	10.6	10.0	10.1	9.7	9.0	8.3	7.4	6.1	5.9	6.6	6.4	6.3	7.5
Baker City, Ore.	5.0	5.8	6.0	6.4	6.6	6.7	6.3	6.0	6.5	5.8	6.1	6.9	6.1	5.2	5.3	5.9	5.5	6.3	4.5	4.1	3.6	4.0	4.5	4.7	5.6
Baltimore, Md.	7.4	7.4	7.1	7.0	6.8	7.0	7.2	7.1	8.0	7.8	8.2	9.0	10.3	10.6	10.9	10.6	10.6	9.2	8.0	7.2	7.0	7.5	8.1	7.7	8.3
Bismarck, N. Dak.	9.6	8.5	8.9	9.8	9.8	9.5	9.4	10.1	9.9	9.5	10.3	11.0	12.0	12.5	13.1	13.2	13.5	13.1	12.2	10.6	9.5	8.8	8.9	9.9	10.6
Block Island, R. I.	22.4	21.3	21.6	21.3	21.6	22.1	22.9	22.5	21.8	21.3	21.3	20.1	20.1	19.7	19.7	19.8	19.5	19.8	20.1	20.1	21.0	21.2	21.5	21.1	21.0
Boston, Mass.	11.5	11.8	12.1	12.4	12.0	11.5	12.0	12.2	13.2	14.2	14.6	14.8	14.5	14.6	14.8	14.1	13.5	12.9	12.6	12.9	13.3	12.9	12.9	12.3	13.1
Buffalo, N. Y.	13.6	13.6	15.1	14.5	14.4	14.1	13.9	13.7	13.6	14.4	14.8	15.1	15.9	14.8	15.3	14.8	13.9	13.9	13.9	13.3	13.3	14.1	14.2	14.0	14.4
Cairo, Ill.	11.6	11.8	11.6	10.9	11.3	10.5	11.5	11.0	11.9	12.0	12.5	13.0	14.0	14.1	13.5	14.1	13.2	12.6	11.9	12.1	12.4	12.7	11.5	11.4	12.2
Cape Henry, Va.	15.6	15.4	15.1	16.3	16.1	16.0	15.8	16.7	16.2	16.1	15.3	15.0	14.1	14.1	13.9	13.8	13.3	13.2	13.0	14.5	14.8	15.6	15.3	15.2	15.0
Charleston, S. C.	9.2	9.0	9.1	8.7	8.5	9.0	9.2	9.6	10.0	10.8	11.7	11.7	11.6	12.1	12.3	11.9	11.3	10.8	8.6	9.0	8.9	8.9	9.4	9.6	10.0
Charlotte, N. C.	9.5	9.0	8.2	7.9	8.0	8.4	8.2	9.1	9.4	10.3	10.3	10.3	11.4	11.1	10.9	10.1	9.9	9.4	8.6	9.0	9.1	8.9	8.5	9.5	9.4
Chattanooga, Tenn.	8.1	8.6	8.1	8.5	7.7	7.0	7.2	7.1	7.9	8.2	8.1	8.8	9.8	10.3	10.2	10.3	11.1	9.9	9.0	9.0	9.4	8.9	8.1	7.7	8.7
Cheyenne, Wyo.	11.2	11.8	10.8	9.4	9.5	10.3	10.0	10.4	10.4	11.7	13.6	14.4	15.0	15.8	16.5	16.1	15.0	14.3	13.2	12.3	11.6	11.5	10.4	11.0	12.3
Chicago, Ill.	21.4	21.0	20.8	20.8	20.8	20.6	19.2	18.1	18.5	19.3	20.6	20.6	21.1	21.1	21.6	22.4	22.4	22.6	20.9	21.3	21.2	21.2	21.5	22.0	20.9
Cincinnati, Ohio.	8.9	8.4	8.6	9.5	9.4	9.2	8.6	8.6	8.5	9.2	9.5	9.9	10.4	10.9	11.1	10.9	10.4	10.1	9.2	8.9	8.9	8.9	8.9	9.1	9.5
Cleveland, Ohio.	15.0	15.9	16.2	15.8	16.1	16.2	15.8	14.8	15.1	16.0	15.9	16.1	16.8	16.7	15.9	15.8	14.9	13.1	12.9	13.2	14.3	15.5	15.0	15.4	15.3
Colorado Sprgs, Colo.	9.4	9.3	9.1	9.1	9.6	9.4	8.8	7.9	8.5	9.0	9.0	9.5	11.1	10.9	11.9	12.2	12.6	12.1	10.7	8.3	6.9	6.3	7.5	8.7	9.5
Columbia, Mo.	7.4	7.9	7.6	7.8	7.2	7.4	7.5	7.4	8.1	9.4	9.6	10.1	10.5	9.9	10.0	9.9	9.5	9.0	8.3	7.0	6.9	6.9	6.7	7.2	8.3
Columbus, Ohio.	11.2	11.0	10.5	11.0	11.3	11.1	11.1	11.0	11.8	12.1	12.0	12.5	13.5	13.8	13.1	12.9	12.4	12.2	11.6	11.1	11.3	12.1	12.3	12.4	11.8
Concordia, Kans.	6.9	6.5	6.8	6.6	6.9	6.9	6.4	6.6	6.4	7.0	8.7	9.2	9.1	10.1	10.3	10.0	10.1	10.1	7.9	6.5	7.1	6.9	6.9	7.0	7.8
Corpus Christi, Tex.	11.5	11.9	11.5	11.4	10.3	11.4	10.3	10.6	10.7	11.5	12.3	12.8	13.1	12.9	13.1	13.9	14.4	15.0	14.4	12.9	11.9	10.9	11.2	11.2	12.1
Davenport, Iowa.	9.8	9.3	9.0	9.3	8.9	8.8	8.3	8.3	8.5	9.4	10.8	11.9	11.5	11.8	12.4	12.5	12.3	11.7	10.1	9.9	9.5	8.9	8.9	9.5	10.0
Denver, Colo.	6.2	7.3	6.9	6.8	7.4	6.8	6.4	5.9	6.0	6.4	6.2	7.0	7.7	8.5	8.1	9.0	9.6	10.2	10.5	8.5	7.2	6.5	6.8	6.1	7.4
Des Moines, Iowa.	8.0	7.5	7.4	6.7	7.0	7.0	6.7	6.5	7.4	8.1	8.7	10.0	10.3	10.8	11.2	11.2	10.9	9.5	8.5	8.0	7.6	7.8	7.7	7.4	8.4
Detroit, Mich.	14.2	13.2	12.8	12.4	12.8	12.4	12.5	12.3	12.3	13.0	12.6	13.4	13.8	14.4	14.7	14.8	13.7	13.7	13.5	13.0	13.3	13.1	13.8	14.6	13.3
Dodge City, Kans.	10.6	10.8	10.8	10.8	10.1	9.8	10.2	10.5	10.0	10.6	11.0	11.7	12.0	12.4	12.7	12.4	11.9	11.6	9.9	9.0	8.9	10.0	10.6	10.2	10.8
Dubuque, Iowa.	5.4	5.0	5.0	5.4	5.3	4.8	4.3	4.1	4.3	5.8	6.4	7.0	7.4	8.2	8.7	8.4	8.0	7.2	5.9	5.2	5.4	5.6	5.8	5.9	6.0
Duluth, Minn.	5.2	4.6	4.8	4.7	4.4	4.5	4.4	4.4	4.5	5.2	6.5	7.4	8.3	8.6	8.9	9.1	8.6	8.1	7.7	7.7	7.2	6.8	6.8	5.8	6.4
Eastport, Me.	14.1	13.0	12.4	12.4	12.5	12.4	12.6	13.6	14.2	15.3	14.7	15.4	15.1	16.4	15.8	15.5	14.7	14.6	14.7	14.6	13.5	13.8	13.7	14.1	14.1
El Paso, Tex.	10.1	10.5	11.1	11.0	11.9	10.4	10.6	10.0	9.4	8.8	9.6	11.1	12.6	13.2	14.2	14.8	14.9	14.8	14.2	12.3	10.4	9.5	9.9	9.9	11.5
Erie, Pa.	13.0	12.9	13.4	13.4	13.1	13.6	13.3	13.2	13.7	14.0	14.2	14.2	13.9	13.6	13.1	12.1	11.9	12.0	12.1	12.7	12.5	12.5	12.5	12.4	13.1
Eureka, Cal.	4.9	4.9	5.2	5.6	5.1	4.7	4.9	4.7	4.8	4.5	4.6	4.7	5.1	5.0	5.2	5.5	5.0	10.1	10.2	10.1	8.8	7.9	6.6	6.1	6.5
Fort Canby, Wash.	17.6	17.2	16.7	16.9	17.6	17.4	17.5	17.3	17.8	17.4	18.0	17.9	18.1	18.8	18.7	18.6	17.9	18.1	18.8	20.0	21.8	19.5	17.4	17.8	18.1
Fort Smith, Ark.	7.7	7.8	7.6	8.2	7.4	7.5	7.9	8.8	8.8	10.1	10.1	9.2	9.0	9.3	9.2	9.8	10.0	8.8	7.7	7.0	7.9	8.2	7.1	7.1	8.5
Fresno, Cal.	4.0	4.4	5.0	5.4	5.2	5.4	5.2	5.4	5.9	5.5	5.8	6.2	6.1	6.5	6.2	5.6	5.4	5.6	5.4	4.6	4.3	4.6	4.4	4.4	5.3
Galveston, Tex.	14.0	13.5	13.3	13.3	13.5	13.4	13.6	14.2	15.0	15.1	14.1	14.7	14.4	14.0	13.9	13.8	13.4	13.4	12.9	13.2	13.4	13.8	13.9	13.9	13.8
Grand Haven, Mich.	14.2	14.0	14.5	13.2	13.1	13.3	13.0	12.8	12.5	12.8	12.4	12.7	13.2	13.4	13.4	13.6	14.0	13.6	12.9	12.5	13.7	13.7	14.2	14.7	13.4
Green Bay, Wis.	9.1	9.2	9.2	8.8	9.4	9.5	8.6	8.7	9.4	9.4	10.1	10.6	10.9	11.4	13.0	13.5	12.8	12.0	10.4	9.8	9.4	9.5	9.6	9.6	10.2
Hannibal, Mo.	9.2	9.7	9.7	9.7	9.7	9.5	9.5	9.7	9.5	9.5	10.6	11.9	13.0	13.1	12.8	12.1	11.1	10.4	9.3	10.0	10.6	9.5	9.5	9.5	10.6
Harrisburg, Pa.	8.1	7.7	7.8	8.3	8.4	8.0	7.4	9.0	8.8	8.8	8.4	8.3	8.4	9.1	10.0	10.1	9.5	8.6	8.1	8.0	7.7	8.1	7.3	7.5	8.4
Hatteras, N. C.	17.2	17.4	17.9	18.1	18.1	17.9	18.0	17.5	17.2	16.9	16.9	16.8	17.5	18.1	17.7	17.3	17.6	16.1	16.2	16.3	16.3	17.2	16.7	16.2	17.2
Havre, Mont.	10.8	10.8	11.1	10.2	10.7	11.3	11.1	10.5	9.8	11.0	11.8	13.6	14.4	14.2	14.0	14.5	14.1	14.2	12.6	11.5	11.1	10.5	10.7	12.0	12.0
Helena, Mont.	6.8	7.1	7.2	7.2	7.8	6.5	5.2	5.4	5.2	5.2	5.1	5.2	6.2	6.8	7.2	7.8	8.4	9.2	8.3	7.3	7.1	7.7	8.1	7.1	6.9
Huron, S. Dak.	13.1	12.8	13.4	14.0	13.9	15.7	13.6	13.7	14.4	14.5	15.5	16.0	16.3	16.3	16.1	15.5	15.3	14.1	12.3	12.4	12.1	12.5	12.0	12.9	14.0
Idaho Falls, Idaho.	8.3	7.8	7.5	7.6	7.8	7.9	7.9	7.6	7.7	8.3	8.5	8.0	8.0	7.4	7.3	7.9	8.5	8.2	8.3	7.9	7.5	8.2	7.8	8.0	7.9
Indianapolis, Ind.	7.1	7.2	7.1	6.9	6.8	6.9	6.7	6.8	7.3	7.9	8.2	9.0	9.1	9.2	8.9	9.1	9.2	9.1	8.8	8.5	8.4	8.4	7.7	7.1	7.9
Jacksonville,																									

TABLE VII.—Average wind movement, etc.—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Oklahoma, Okla.	9.5	9.5	10.6	10.9	11.2	11.5	11.5	11.2	11.4	11.1	11.9	12.3	12.7	12.6	12.9	12.9	13.1	12.2	11.4	9.9	9.3	9.1	9.8	9.4	11.2
Olympia, Wash.	6.2	5.5	5.5	6.7	6.2	5.9	6.6	6.4	7.0	7.2	6.8	6.5	7.5	8.4	8.8	8.3	8.2	8.1	7.2	6.9	6.3	6.1	6.1	6.3	6.9
Omaha, Nebr.	7.8	7.0	7.2	6.9	7.2	6.8	7.5	6.7	6.7	7.4	7.7	8.5	9.3	9.2	9.4	9.8	9.2	8.4	7.7	6.9	7.4	7.9	8.0	7.5	7.8
Oswego, N. Y.	13.7	14.2	14.5	14.0	14.8	14.5	14.8	15.0	14.4	14.7	14.4	13.9	14.5	14.9	14.8	14.4	14.5	13.5	12.9	13.5	14.5	14.2	14.2	14.2	14.3
Palestine, Tex.	7.5	7.3	7.0	6.7	6.6	6.6	7.2	7.5	7.5	8.2	9.0	8.9	9.4	9.8	9.5	9.6	9.7	8.8	7.8	6.5	6.0	6.8	7.2	7.2	7.9
Parkersburg, W. Va. ..	5.6	5.9	5.9	6.0	6.5	7.0	6.8	7.1	7.1	6.9	7.4	7.8	8.5	8.2	8.8	8.6	8.3	7.4	6.0	6.5	6.3	6.0	5.6	6.9	
Pensacola, Fla.	8.6	8.9	10.1	9.6	9.0	8.9	9.8	9.5	9.6	10.2	10.4	11.1	11.9	12.2	12.6	12.0	11.8	10.8	10.1	8.8	9.5	9.3	9.6	9.8	10.2
Philadelphia, Pa.	12.2	11.8	11.9	11.7	11.6	12.0	11.7	12.1	13.0	13.3	13.7	13.2	13.5	13.9	13.4	13.1	12.4	12.0	11.3	11.1	10.9	11.0	12.0	12.3	12.3
Pierre, S. Dak.	6.9	7.5	7.0	7.9	7.1	6.9	6.8	6.6	7.0	8.6	8.9	9.5	10.2	11.0	11.4	11.4	11.4	11.1	10.0	8.8	8.0	7.9	7.1	7.1	8.6
Pikes Peak, Colo.	29.1	27.4	28.5	29.0	28.6	28.9	28.8	27.5	27.9	28.7	28.0	26.8	24.4	24.3	25.3	26.8	26.6	27.9	27.0	28.5	27.8	27.0	27.5	26.9	27.5
Pittsburg, Pa.	7.2	6.9	6.8	6.6	7.2	6.9	7.2	7.5	7.9	8.9	9.5	9.7	10.2	9.8	9.5	9.4	9.0	8.6	7.7	7.5	7.0	7.6	7.4	7.0	8.0
Port Angeles, Wash. ..	4.9	5.5	5.4	5.8	5.5	5.4	5.4	5.7	5.4	5.8	5.1	5.0	4.1	4.7	4.8	5.7	4.9	5.0	5.2	4.8	4.8	5.1	4.5	5.0	5.1
Port Huron, Mich.	13.7	13.9	13.5	14.0	14.2	14.1	14.0	13.3	13.7	14.5	14.2	14.7	14.6	14.2	14.9	15.5	14.6	13.3	13.0	12.8	13.1	13.7	14.0	14.0	14.0
Portland, Me.	7.0	6.9	7.4	7.2	7.2	6.9	7.6	7.2	8.3	9.3	9.2	9.5	9.5	9.6	9.8	9.4	9.2	8.7	8.6	8.0	8.4	8.3	8.0	7.8	8.3
Portland, Oreg.	11.0	9.8	9.5	9.6	8.9	10.0	10.2	10.1	9.7	10.0	10.6	10.6	10.3	10.9	11.0	11.4	12.1	11.3	11.6	11.9	11.5	11.1	11.5	11.5	10.7
Pueblo, Colo.	6.3	6.2	6.4	6.0	6.0	6.4	6.3	5.8	5.7	5.5	5.9	5.7	6.1	6.5	7.2	9.5	11.3	11.2	10.2	8.8	7.4	6.4	6.1	6.1	7.0
Raleigh, N. C.	7.8	8.4	8.7	8.5	7.7	7.8	7.9	7.4	8.2	8.6	9.3	9.3	9.1	9.1	9.0	8.0	8.3	6.8	6.2	6.9	7.6	7.3	7.1	8.0	8.0
Rapid City, S. Dak.	7.1	8.2	8.2	8.1	8.5	9.2	8.5	9.3	8.9	8.6	8.0	8.3	8.5	9.7	11.0	10.5	10.0	9.4	8.6	6.5	5.9	7.1	7.1	7.3	8.4
Red Bluff, Cal.	6.3	6.6	7.1	7.0	7.8	8.5	8.2	9.7	10.1	10.8	10.3	10.5	11.0	11.2	10.2	10.3	9.6	9.7	10.0	9.5	7.8	7.1	6.8	6.0	8.8
Rochester, N. Y.	8.9	8.6	8.7	9.3	9.1	10.3	10.4	9.9	10.6	11.4	12.0	12.3	12.0	11.6	10.2	11.1	10.2	8.5	8.4	8.5	7.8	8.1	8.2	8.7	9.9
Roseburg, Oreg.	3.3	3.1	3.4	3.2	2.8	2.8	2.6	2.7	2.7	2.5	2.7	3.0	3.6	3.6	4.1	4.8	5.1	5.9	5.4	4.8	4.1	3.5	3.7	3.5	3.6
Sacramento, Cal.	7.2	8.2	7.7	7.9	8.5	8.3	8.6	9.1	8.9	8.9	9.6	10.8	11.4	12.0	12.7	12.1	11.6	10.9	9.9	9.1	8.0	7.0	7.2	7.6	9.3
St. Louis, Mo.	12.4	12.3	12.2	12.0	11.6	12.4	11.6	11.7	12.0	12.9	13.6	14.4	13.9	14.8	15.0	15.3	14.2	12.6	11.9	12.8	13.4	12.8	12.0	13.0	13.0
St. Paul, Minn.	7.6	6.9	6.3	6.2	6.0	5.9	6.1	6.7	6.8	7.1	8.4	9.1	10.0	10.5	10.6	10.6	10.7	10.7	9.5	8.5	7.3	7.3	7.2	7.2	8.1
St. Vincent, Minn.	8.4	8.9	9.4	9.9	10.4	10.5	10.8	11.2	11.3	12.0	13.4	14.8	13.8	14.6	14.4	13.7	12.9	11.9	9.4	8.9	8.6	8.4	8.1	8.1	11.0
Salt Lake City, Utah. ..	6.0	5.8	5.7	5.2	5.1	5.4	5.3	5.6	5.6	5.1	5.7	6.4	6.8	8.3	8.6	9.1	9.2	8.6	7.6	6.5	5.2	5.4	5.4	6.4	6.4
San Antonio, Tex.	7.5	7.4	7.3	7.6	7.1	6.8	7.3	7.2	7.5	7.8	8.5	9.9	11.5	11.4	11.2	11.6	12.0	11.8	11.4	10.1	8.5	8.4	8.8	9.0	9.0
San Diego, Cal.	3.9	3.6	3.8	4.0	3.9	4.6	4.4	4.6	4.4	4.6	4.3	3.9	4.5	5.7	6.8	8.0	8.8	8.9	8.6	7.4	6.0	3.6	3.0	3.5	5.2
Sandusky, Ohio.	11.4	11.2	11.2	11.3	11.1	10.8	11.4	10.5	10.9	11.2	10.6	10.8	11.4	10.9	10.8	10.9	10.7	10.0	10.6	9.6	10.3	10.8	10.5	9.9	10.8
San Francisco, Cal.	10.1	8.7	8.8	8.7	8.5	8.0	7.2	7.5	7.1	8.2	8.6	9.3	9.6	10.2	11.0	12.0	13.9	13.5	13.0	12.8	11.3	11.3	11.2	9.9	9.9
Santa Fe, N. Mex.	5.2	5.6	5.6	5.3	4.1	3.9	4.1	4.4	4.5	4.4	5.6	6.7	7.5	8.9	9.3	9.5	9.0	9.1	8.8	6.6	5.3	5.4	5.9	5.2	6.2
Sault Ste. Marie, Mich. ..	8.1	8.3	8.3	7.1	7.2	6.8	7.1	7.6	7.9	8.2	8.8	9.8	10.8	11.4	11.5	11.4	11.1	10.4	9.3	8.5	9.0	8.5	8.5	9.1	8.9
Savannah, Ga.	8.8	8.4	9.0	9.2	9.0	9.2	8.2	8.1	8.8	10.4	10.9	11.1	11.5	11.4	11.2	11.8	11.4	10.8	9.9	9.1	8.6	8.9	9.1	8.7	9.7
Seattle, Wash.	7.2	7.6	8.1	8.6	9.1	9.1	8.9	8.9	8.2	8.4	8.2	7.8	8.2	8.5	8.7	9.0	9.2	9.1	9.4	8.9	8.3	8.2	8.1	8.5	8.5
Shreveport, La.	9.2	9.0	8.2	8.1	8.0	7.9	7.9	8.5	8.7	9.5	10.4	10.4	10.4	10.9	11.0	9.8	10.1	9.6	8.9	8.2	7.9	7.7	7.9	8.5	9.0
Sioux City, Iowa.	8.9	8.8	8.9	9.0	9.8	10.0	9.7	10.2	9.8	10.0	11.4	12.9	14.3	14.8	15.6	15.5	15.2	14.3	12.4	11.6	10.5	9.8	10.3	9.3	11.4
Southport, N. C.	11.5	11.0	11.2	11.7	11.9	10.9	10.2	10.1	10.5	12.0	12.7	13.3	13.5	13.2	13.2	12.9	12.3	10.9	8.7	9.4	9.7	10.5	11.1	11.8	11.4
Spokane, Wash.	6.1	6.0	6.7	6.7	6.5	6.2	6.0	5.2	5.8	6.2	5.9	6.6	7.8	7.4	8.4	8.2	8.4	8.5	7.9	7.2	7.1	6.1	6.0	6.1	6.8
Springfield, Ill.	10.1	9.6	9.7	10.1	10.4	9.9	9.9	10.2	10.4	11.3	11.5	12.0	12.8	13.4	13.6	13.1	13.2	12.4	11.1	10.8	10.9	11.0	10.9	10.0	11.2
Springfield, Mo.	9.8	10.1	11.1	11.0	11.1	11.1	10.7	11.2	12.2	12.4	13.4	12.5	12.7	12.9	12.6	12.9	12.2	11.6	11.1	10.6	10.5	10.2	9.9	10.7	11.4
Tampa, Fla.	5.8	5.7	6.3	6.1	6.6	7.1	6.5	6.3	7.2	8.2	9.6	10.2	11.2	11.1	11.3	11.0	11.1	9.8	8.0	6.5	6.1	5.6	5.0	5.5	7.8
Tatoosh Island, Wash. ..	19.2	18.8	18.4	19.0	20.7	20.0	18.6	18.8	18.5	19.4	18.5	18.4	19.9	20.8	20.3	20.6	21.2	19.7	19.5	18.3	17.4	18.3	19.2	20.2	19.3
Titusville, Fla.	9.0	8.6	8.6	8.9	9.0	8.6	8.8	9.1	9.0	11.8	14.2	15.0	16.2	15.7	16.0	15.6	15.5	14.9	14.2	12.8	11.2	9.8	9.6	9.0	11.7
Toledo, Ohio.	12.1	11.7	10.7	10.8	11.8	11.2	11.4	11.1	10.7	11.7	13.0	12.9	13.5	13.0	13.4	13.4	13.9	13.1	11.9	11.9	11.6	11.2	12.7	12.6	12.2
Tucson, Ariz.	7.1	6.9	7.0	7.1	7.0	6.8	6.3	5.9	6.1	6.9	7.1	8.9	9.0	10.2	11.6	13.6	12.5	12.3	11.9	9.7	8.2	8.0	7.6	7.9	8.6
Valentine, Nebr.	8.9	9.4	9.3	9.5	8.5	9.1	8.7	8.6	9.6	9.1	10.3	11.6	13.4	13.6	13.3	13.6	13.4	12.5	10.8	8.7	8.5	9.0	8.6	9.5	10.3
Vicksburg, Miss.	9.0	8.2	8.5	9.2	9.1	9.4	9.4	9.1	9.8	10.4	10.9	9.8	10.3	10.0	10.3	10.4	10.2	9.5	8.4	8.2	8.5	8.7	8.8	9.4	9.4
Vineyard Haven, Mass. ..	11.2	11.4	11.2	10.8	10.8	10.1	10.5	11.3	11.6	12.0	12.8	12.8	12.4	13.2	12.5	12.2	11.4	11.0	10.5	10.6	10.7	11.4	11.5	11.3	11.5
Walla Walla, Wash.	6.4	6.4	6.6	6.5	6.9	5.8	6.1	6.3	6.4	6.2	5.8	6.0	6.9	7.8	9.1	9.7	9.5	8.3	7.5	6.6	6.7	6.9	7.0	6.8	7.0
Washington, D. C.	7.4	7.2	7.0	7.1	6.9	6.3	6.2	6.6	7.4	8.4	9.2	10.3	11.1	11.1	11.1	11.1	11.1	10.2	8.6	7.8	7.0	6.6	7.2	7.6	7.9
Wichita, Kans.	9.3	9.5	9.5	9.4	9.4	9.6	10.0	9.8	10.3	10.5	11.4	12.5	12.6	13.0	13.1	13.3	13.0	12.2	10.3	8.9	8.3	8.5	9.7	9.9	10.6
Williston, N. Dak.	8.3	8.3	8.3	9.3	8.9	9.0	8.6	8.4	6.5	7.3	8.8	9.9	12.3	14.8	14.1	13.8	13.3	13.1	11.8	11.0	10.3	9.5	10.1	9.9	10.2
Wilmington, N. C.	11.2	10.4	10.7	10.6	10.0	10.5	10.5	9.5	10.5	11.8	11.8	12.9	1												

TABLE VIII.—Prevailing and resultant winds from self-registers for February, 1894.

Number.	Station.	Prevailing wind.		Total movement.		Resultant direction.			Resultant movement.		Azimuth of movement minus direction.	Ratio of resultant movement to total movement.
		Direction from.	Duration.	Monthly.	Hourly average.	Direction from.	Duration.	Average hourly velocity.	Direction from.	Amount.		
	(1)	(2)	(3) Hours.	(4) Miles.	(5) Miles.	(6)	(7) Hours.	(8) Miles.	(9)	(10) Miles.	(11) °	(12)
1	Eastport, Me.	nw.	186	9,497	14.1	n. 61 w.	250	11.6	n. 44 w.	2,890	+17	0.304
2	Portland, Me.	nw.	162	5,574	8.3	n. 69 w.	264	7.6	n. 59 w.	2,000	+10	0.359
3	Boston, Mass.	w.	158	8,771	13.1	n. 70 w.	295	13.2	n. 63 w.	3,900	+7	0.445
4	Nantucket, Mass.	n.	144	9,538	14.2	n. 10 w.	145	18.9	n. 29 e.	2,760	+39	0.289
5	New Haven, Conn.	n.	173	6,888	10.2	n. 27 w.	240	11.7	n. 11 w.	2,800	+16	0.406
10	Albany, N. Y.	s.	184	6,175	9.2	n. 85 w.	140	11.3	n. 81 w.	1,583	+4	0.256
11	New York, N. Y.	nw.	187	8,235	12.3	n. 56 w.	188	16.8	n. 59 w.	3,150	+17	0.382
12	Philadelphia, Pa.	ne.	163	8,279	12.3	n. 12 w.	204	16.3	n. 6 w.	3,333	+6	0.402
13	Baltimore, Md.	n.	113	5,553	8.3	n. 3 e.	118	16.1	n. 23 w.	1,900	-26	0.342
14	Washington, D. C.	nw.	173	5,331	7.9	n. 7 w.	167	7.5	n. 25 w.	1,255	-18	0.236
17	Lynchburg, Va.	sw.	156	3,688	5.5	n. 84 w.	168	8.8	n. 53 w.	1,471	+31	0.399
18	Norfolk, Va.	ne.	151	6,462	9.6	n. 11 w.	96	14.1	n. 12 w.	1,350	-31	0.209
24	Wilmington, N. C.	sw.	167	7,382	11.0	n. 34 w.	112	20.1	n. 85 w.	2,248	-6	0.304
25	Augusta, Ga.	w.	148	5,030	7.5	s. 82 w.	170	10.6	s. 80 w.	1,797	-2	0.357
27	Savannah, Ga.	s.	171	6,537	9.7	s. 62 w.	167	8.1	s. 73 w.	1,360	+11	0.208
28	Jacksonville, Fla.	sw.	117	5,792	8.6	s. 57 w.	36	29.1	s. 42 w.	1,040	-15	0.181
29	Key West, Fla.	se.	236	6,855	10.2	s. 76 e.	385	8.8	n. 86 e.	3,377	-18	0.493
33	Atlanta, Ga.	nw.	160	8,425	12.5	n. 85 w.	106	15.3	n. 85 w.	1,625	0	0.193
34	Vicksburg, Miss.	ne.	126	6,297	9.4	n. 55 e.	84	3.0	n. 40 e.	250	+85	0.397
39	New Orleans, La.	ne.	153	6,887	10.2	n. 60 e.	125	8.6	n. 30 e.	1,080	-30	0.157
42	Little Rock, Ark.	ne.	131	6,528	9.7	n. 10 e.	74	19.9	n. 3 w.	1,469	-13	0.225
44	Galveston, Tex.	se.	161	9,285	13.8	n. 85 e.	116	14.5	n. 50 e.	1,680	-35	0.181
45	Knoxville, Tenn.	w.	184	4,299	6.4	n. 70 w.	168	8.2	n. 82 w.	1,375	-12	0.320
49	Memphis, Tenn.	ne.	189	6,406	9.5	n. 33 e.	86	10.9	n. 27 e.	935	-6	0.146
50	Nashville, Tenn.	nw.	164	5,416	8.1	n. 50 e.	88	3.5	n. 6 w.	308	-56	0.569
52	Louisville, Ky.	nw.	143	7,439	11.1	s. 76 w.	164	17.6	s. 76 w.	1,825	0	0.245
53	Indianapolis, Ind.	nw.	185	5,341	7.9	n. 84 w.	125	8.5	n. 90 w.	1,062	-6	0.199
54	Cincinnati, Ohio.	nw.	162	6,376	9.5	n. 89 w.	80	22.2	n. 80 w.	1,775	+9	0.278
55	Columbus, Ohio.	nw.	159	7,963	11.8	s. 84 w.	120	19.6	n. 80 w.	2,350	+6	0.295
56	Pittsburg, Pa.	nw.	176	5,400	8.0	s. 86 w.	136	11.4	n. 86 w.	1,550	+8	0.287
58	Buffalo, N. Y.	w.	161	9,656	14.4	n. 84 w.	213	22.0	s. 87 w.	4,680	-9	0.485
60	Rochester, N. Y.	sw.	270	6,660	9.9	n. 56 w.	240	12.5	s. 66 w.	3,010	+10	0.199
62	Cleveland, Ohio.	se.	213	10,308	15.3	s. 20 w.	90	24.7	s. 23 w.	2,220	+3	0.215
64	Toledo, Ohio.	sw.	179	8,171	12.2	s. 87 w.	202	12.3	s. 88 w.	2,478	+1	0.303
65	Detroit, Mich.	sw.	200	8,961	13.3	s. 88 w.	218	18.3	s. 79 w.	3,994	-9	0.446
66	Alpena, Mich.	w.	162	7,836	11.7	s. 71 w.	239	8.7	s. 69 w.	2,084	-2	0.266
67	Grand Haven, Mich.	sw.	154	9,002	13.4	s. 50 w.	88	25.1	s. 68 w.	2,221	+15	0.247
68	Marquette, Mich.	nw.	140	7,396	11.0	n. 88 w.	222	10.8	s. 81 w.	2,400	-11	0.324
70	Sault Ste. Marie, Mich.	se.	213	6,009	8.9	s. 4 e.	87	9.0	s. 70 w.	784	+74	0.130
71	Chicago, Ill.	sw.	193	14,023	20.9	s. 88 w.	240	20.3	s. 83 w.	4,879	-5	0.348
73	Milwaukee, Wis.	sw.	159	8,588	12.5	s. 88 w.	311	11.0	n. 89 w.	3,425	+3	0.408
74	Duluth, Minn.	w.	120	4,198	6.4	n. 41 w.	135	9.0	n. 43 w.	1,213	-2	0.289
75	Moorhead, Minn.	nw.	182	7,814	11.6	s. 86 w.	203	10.5	s. 73 w.	2,140	-14	0.274
77	Bismarck, N. Dak.	nw.	303	7,101	10.6	n. 55 w.	270	15.4	n. 52 w.	4,150	+6	0.584
79	Saint Paul, Minn.	se.	208	5,411	8.1	s. 29 w.	174	9.7	n. 61 w.	1,688	+32	0.312
81	Davenport, Iowa.	sw.	171	6,749	10.0	s. 88 w.	276	10.4	s. 80 w.	2,880	-8	0.427
82	Des Moines, Iowa.	sw.	164	5,655	8.4	n. 71 w.	230	9.5	n. 70 w.	2,190	+1	0.387
88	Saint Louis, Mo.	nw.	187	8,758	13.0	n. 60 w.	134	13.4	n. 86 w.	1,796	-26	0.205
90	Kansas City, Mo.	n.	164	7,262	10.8	n. 19 w.	100	11.3	n. 42 w.	1,130	-23	0.156
92	Omaha, Nebr.	nw.	245	5,266	7.8	n. 81 w.	189	6.9	n. 69 w.	1,300	+12	0.247
96	Huron, S. Dak.	nw.	247	9,418	14.0	s. 76 w.	128	12.2	s. 75 w.	1,562	-1	0.166
98	Harro, Mont.	sw.	245	8,092	12.0	s. 81 w.	379	15.7	s. 65 w.	5,805	-16	0.717
100	Helena, Mont.	sw.	364	4,629	6.9	s. 62 w.	459	8.0	s. 57 w.	3,683	-5	0.796
105	Colorado Springs, Colo.	n.	307	6,390	9.5	n. 13 e.	195	10.3	n. 14 w.	2,000	-27	0.313
107	Denver, Colo.	s.	164	4,982	7.4	s. 46 w.	150	6.4	s. 60 w.	990	+14	0.199
108	Pikes Peak, Colo.	w.	203	18,597	27.5	n. 76 w.	273	35.8	n. 82 w.	9,762	-6	0.527
111	Dodge City, Kans.	nw.	164	7,238	10.8	n. 10 w.	217	9.2	n. 1 w.	1,997	+9	0.276
114	Arlene, Tex.	nw.	153	8,315	12.4	s. 88 w.	96	15.5	n. 84 w.	1,485	+8	0.179
116	El Paso, Tex.	nw.	377	7,695	11.5	n. 52 w.	285	16.1	n. 55 w.	4,595	-3	0.597
117	Santa Fe, N. Mex.	ne.	149	4,199	6.2	n. 31 w.	20	17.5	n. 53 w.	350	-22	0.834
119	Yuma, Ariz.	ne.	122	4,954	7.4	n. 33 w.	181	11.8	n. 41 w.	2,132	-8	0.430
120	Keeler, Cal.	e.	127	5,583	8.3	n. 49 e.	42	37.1	n. 40 w.	1,559	-89	0.279
122	Salt Lake City, Utah.	se.	146	4,305	6.4	s. 6 w.	193	6.6	n. 14 w.	1,283	+8	0.298
125	Spokane, Wash.	sw.	168	4,571	6.8	s. 14 e.	205	11.7	s. 7 w.	2,394	-21	0.524
131	Portland, Oregon.	sw.	194	7,161	10.7	s. 13 w.	225	18.2	n. 21 w.	4,100	+8	0.573
133	Roseburg, Oregon.	sw.	137	2,430	3.6	s. 7 w.	186	6.0	s. 21 w.	1,122	+14	0.462
137	San Francisco, Cal.	sw.	229	6,675	9.9	s. 56 w.	228	14.8	s. 44 w.	3,380	-12	0.506
140	San Diego, Cal.	w.	191	3,488	5.2	n. 52 w.	204	7.4	n. 75 w.	1,503	-23	0.431

TABLE IX.—Resultant winds from observations at 8 a. m. and 8 p. m., daily, during February, 1894.

Number.	Station.	Component direction from—				Resultant.		Number.	Station.	Component direction from—				Resultant.	
		N.	S.	E.	W.	Direction from—	Duration.			N.	S.	E.	W.	Direction from—	Duration.
<i>New England.</i>															
1	Eastport, Me.	21	13	11	27	n. 64 w.	18	73	Green Bay, Wis.	14	28	3	21	n. 52 w.	23
2	Portland, Me.	21	11	4	29	n. 68 w.	27	74	Duluth, Minn.	20	8	15	26	n. 43 w.	16
3	Northfield, Vt.	19	30	5	9	s. 19 w.	12		<i>North Dakota.</i>						
4	Boston, Mass.	21	13	6	31	n. 72 w.	26	75	Moorhead, Minn.	19	19	7	25	.. w.	18
5	Nantucket, Mass.	26	15	15	15	n.	11	76	Saint Vincent, Minn.	19	19	6	21	.. w.	15
6	Woods Holl, Mass.	10	8	4	13	n. 77 w.	9	77	Bismarck, N. Dak.	21	8	11	28	n. 52 w.	21
7	Block Island, R. I.	24	10	18	23	n. 19 w.	15	78	Williston, N. Dak.	10	25	9	24	n. 45 w.	21
8	New Haven, Conn.	28	9	13	19	n. 17 w.	20		<i>Upper Mississippi Valley.</i>						
9	New London, Conn.	22	10	7	30	n. 62 w.	26	79	Saint Paul, Minn.	9	24	19	22	n. 11 w.	15
<i>Middle Atlantic States.</i>															
10	Albany, N. Y.	21	21	4	18	.. w.	14	80	La Crosse, Wis.	21	26	3	16	n. 69 w.	14
11	New York, N. Y.	23	14	13	23	n. 48 w.	13	81	Davenport, Iowa	17	17	7	29	.. w.	22
12	Harrisburg, Pa.	17	6	26	17	n. 39 e.	14	82	Des Moines, Iowa	24	15	8	22	n. 57 w.	17
13	Philadelphia, Pa.	28	10	16	18	n. 6 w.	18	83	Dubuque, Iowa	19	21	7	19	n. 81 w.	12
14	Atlantic City, N. J.	24	11	13	20	n. 28 w.	15	84	Keokuk, Iowa	23	17	9	23	n. 67 w.	15
15	Baltimore, Md.	23	11	19	14	n. 22 e.	13	85	Cairo, Iowa	24	19	12	10	n. 22 e.	5
16	Washington, D. C.	27	11	15	13	n. 7 e.	16	86	Springfield, Ill.	21	17	8	20	n. 72 w.	13
17	Lynchburg, Va.	19	18	11	20	n. 87 w.	15	87	Hannibal, Mo.	22	14	8	21	n. 58 w.	15
18	Norfolk, Va.	23	18	15	15	n.	5	88	Saint Louis, Mo.	24	17	10	16	n. 41 w.	9
<i>South Atlantic States.</i>															
19	Charlotte, N. C.	11	24	18	18	s.	13	89	Columbia, Mo.	12	7	6	12	n. 50 w.	8
20	Hatteras, N. C.	27	16	9	17	n. 35 w.	14	90	Kansas City, Mo.	25	16	12	12	n.	9
21	Kittyhawk, N. C.	21	17	13	17	n. 45 w.	5	91	Springfield, Mo.	24	16	16	13	n. 21 e.	8
22	Raleigh, N. C.	20	21	9	17	n. 83 w.	8	92	Omaha, Nebr.	22	19	8	20	n. 76 w.	12
23	Southport, N. C.	20	13	13	24	n. 58 w.	13	93	Valentine, Nebr.	17	9	4	37	n. 77 w.	34
24	Wilmington, N. C.	18	17	11	23	n. 85 w.	12	94	Siox City Iowa	22	24	6	18	n. 81 w.	12
25	Charleston, S. C.	19	16	14	20	n. 64 w.	7	95	Pierre, S. Dak.	19	19	16	20	.. w.	4
26	Augusta, Ga.	13	16	13	27	n. 78 w.	14		Huron, S. Dak.	16	21	17	22	n. 45 w.	7
27	Savannah, Ga.	14	21	12	22	n. 55 w.	12	96	<i>Northern slope.</i>						
28	Jacksonville, Fla.	17	17	17	17	..	0	97							
<i>Florida Peninsula.</i>															
29	Jupiter, Fla.	8	27	13	18	n. 14 w.	20	98	Havre, Mont.	12	19	5	36	n. 77 w.	32
30	Key West, Fla.	9	18	37	2	n. 76 e.	36	99	Miles City, Mont.	7	29	10	16	n. 15 w.	23
31	Tampa, Fla.	14	23	15	19	n. 23 w.	10	100	Helena, Mont.	5	24	6	39	n. 60 w.	38
32	Titusville, Fla.	12	27	11	18	n. 25 w.	17	101	Rapid City, S. Dak.	18	12	8	28	n. 74 w.	21
<i>Eastern Gulf States.</i>															
33	Atlanta, Ga.	18	16	16	23	n. 75 w.	7	102	Cheyenne, Wyo.	20	4	2	39	n. 67 w.	40
34	Pensacola, Fla.	26	13	21	12	n. 35 e.	16	103	Lander, Wyo.	15	16	14	25	n. 85 w.	11
35	Mobile, Ala.	20	15	11	14	n. 11 w.	15	104	Kearney, Nebr.	23	13	9	23	n. 55 w.	17
36	Montgomery, Ala.	20	15	21	14	n. 55 e.	9	105	North Platte, Nebr.	17	16	4	34	n. 88 w.	30
37	Meridian, Miss.	24	18	12	12	..	6	106	<i>Middle slope.</i>						
38	Vicksburg, Miss.	19	17	22	11	n. 80 e.	11	107							
39	New Orleans, La.	19	17	23	10	n. 82 e.	13	108	Colorado Springs, Colo.	30	17	11	6	n. 21 e.	14
<i>Western Gulf States.</i>															
40	Shreveport, La.	20	18	22	13	n. 77 e.	9	109	Denver, Colo.	19	21	8	19	n. 80 w.	11
41	Fort Smith, Ark.	21	6	25	12	n. 41 e.	20	110	Pikes Peak, Colo.	19	12	9	28	n. 71 w.	20
42	Little Rock, Ark.	20	15	16	17	n. 11 w.	5	111	Pueblo, Colo.	14	11	13	24	n. 75 w.	11
43	Corpus Christi, Tex.	25	12	20	10	n. 38 e.	16	112	Concordia, Kans.	26	15	6	17	n. 45 w.	16
44	Galveston, Tex.	20	17	20	15	n. 59 e.	6	113	Dodge City, Kans.	31	10	10	19	n. 23 w.	23
45	Palestine, Tex.	27	12	16	15	n. 3 e.	15		Wichita, Kans.	31	18	7	7	n.	12
46	San Antonio, Tex.	25	12	24	8	n. 51 e.	21	114	Oklahoma, Okla.	30	19	6	11	n. 24 w.	13
<i>Ohio Valley and Tennessee.</i>															
47	Chattanooga, Tenn.	17	19	15	17	n. 45 w.	3	115	<i>Southern slope.</i>						
48	Knoxville, Tenn.	23	11	16	20	n. 18 w.	13	116							
49	Memphis, Tenn.	21	15	18	15	n. 26 e.	7	117	Abilene, Tex.	23	20	9	14	n. 50 w.	6
50	Nashville, Tenn.	21	16	21	13	n. 58 e.	9	118	Amarillo, Tex.	23	16	2	15	n. 62 w.	15
51	Lexington, Ky.	24	16	13	22	n. 48 w.	12	119	<i>Southern plateau.</i>						
52	Louisville, Ky.	17	19	14	17	n. 56 w.	4	120							
53	Indianapolis, Ind.	20	18	13	21	n. 76 w.	8	121	El Paso, Tex.	22	8	13	29	n. 49 w.	21
54	Cincinnati, Ohio	19	20	15	20	n. 79 w.	5	122	Santa Fe, N. Mex.	23	19	14	17	n. 37 w.	5
55	Columbus, Ohio	20	19	11	21	n. 84 w.	10	123	Tucson, Ariz.	19	17	13	25	n. 81 w.	12
56	Pittsburg, Pa.	19	19	12	21	.. w.	9	124	Yuma, Ariz.	25	11	16	16	n.	14
57	Parkersburg, W. Va.	15	20	15	18	n. 31 w.	6	125	Keeler, Cal.	15	16	20	16	n. 76 e.	4
<i>Lower Lake region.</i>															
58	Buffalo, N. Y.	17	12	12	28	n. 73 w.	17	126	<i>Middle plateau.</i>						
59	Oswego, N. Y.	16	24	15	16	n. 7 w.	8	127							
60	Rochester, N. Y.	14	24	11	26	n. 57 w.	18	128	Winnemucca, Nev.	15	13	19	19	n.	2
61	Erie, Pa.	14	21	10	22	n. 60 w.	14	129	Salt Lake City, Utah	9	28	16	16	n.	19
62	Cleveland, Ohio.	14	22	20	18	n. 14 e.	8	130	<i>Northern plateau.</i>						
63	Sandusky, Ohio.	12	19	11	26	n. 65 w.	17	131							
64	Toledo, Ohio.	16	17	10	28	n. 87 w.	18	132	Baker City, Oreg.	10	27	25	12	n. 38 e.	21
65	Detroit, Mich.	11	14	11	31	n. 82 w.	20	133	Idaho Falls, Idaho	28	14	11	20	n. 33 w.	17
<i>Upper Lake region.</i>															
66	Alpena, Mich.	10	20	9	30	n. 65 w.	23	134	Spokane, Wash.	9	29	17	13	n. 12 e.	20
67	Grand Haven, Mich.	13	20	17	20	n. 23 w.	8	135	Walla Walla, Wash.	4	36	9	16	n. 12 e.	33
68	Marquette, Mich.	19	15	6	26	n. 78 w.	20	136	<i>North Pacific coast region.</i>						
69	Port Huron, Mich.	15	22	11	21	n. 55 w.	12	137							
70	Sault Ste. Marie, Mich.	10	22	15	22	n. 30 w.	14	138	Fort Canby, Wash.	7	16	10	17	n. 13 e.	9
71	Chicago, Ill.	18	20	8	27	n. 84 w.	19	139	Olympia, Wash.	9	39	8	6	n. 4 e.	30
72	Milwaukee, Wis.	16	17	4	31	n. 88 w.	27	140	Port Angeles, Wash.	5	33	10	18	n. 16 w.	29
									Seattle, Wash.	12	36	13	5	n. 18 e.	25
									Tatoosh Island, Wash.	1	32	27	17	n. 26 e.	22
									Roseburg, Oreg.	10	32	10	16	n. 15 w.	23
									<i>Middle Pacific coast region.</i>						
									Eureka, Cal.	16	21	13	18	n. 45 w.	7
									Red Bluff, Cal.	21	20	14	19	n. 79 w.	5
									Sacramento, Cal.	17	24	13	16	n. 23 w.	8
									San Francisco, Cal.	10	24	13	25	n. 41 w.	18
									<i>South Pacific coast region.</i>						
									Fresno, Cal.	18	13	25	16	n. 61 e.	10
									Los Angeles, Cal.	23	2	17	24	n. 18 w.	22
									San Diego, Cal.	22	7	14	27	n. 41 w.	20

This is a detailed weather map of North America, showing isobars, isotherms, and other meteorological data. The map includes a grid of latitude and longitude, a scale bar in statute miles and kilometers, and the United States Weather Bureau logo. The map shows a low-pressure system off the West Coast and a high-pressure system over the Great Lakes. Various weather symbols and numbers are plotted across the continent.



Statute Miles

Kilometers

1257

1208

11.5°

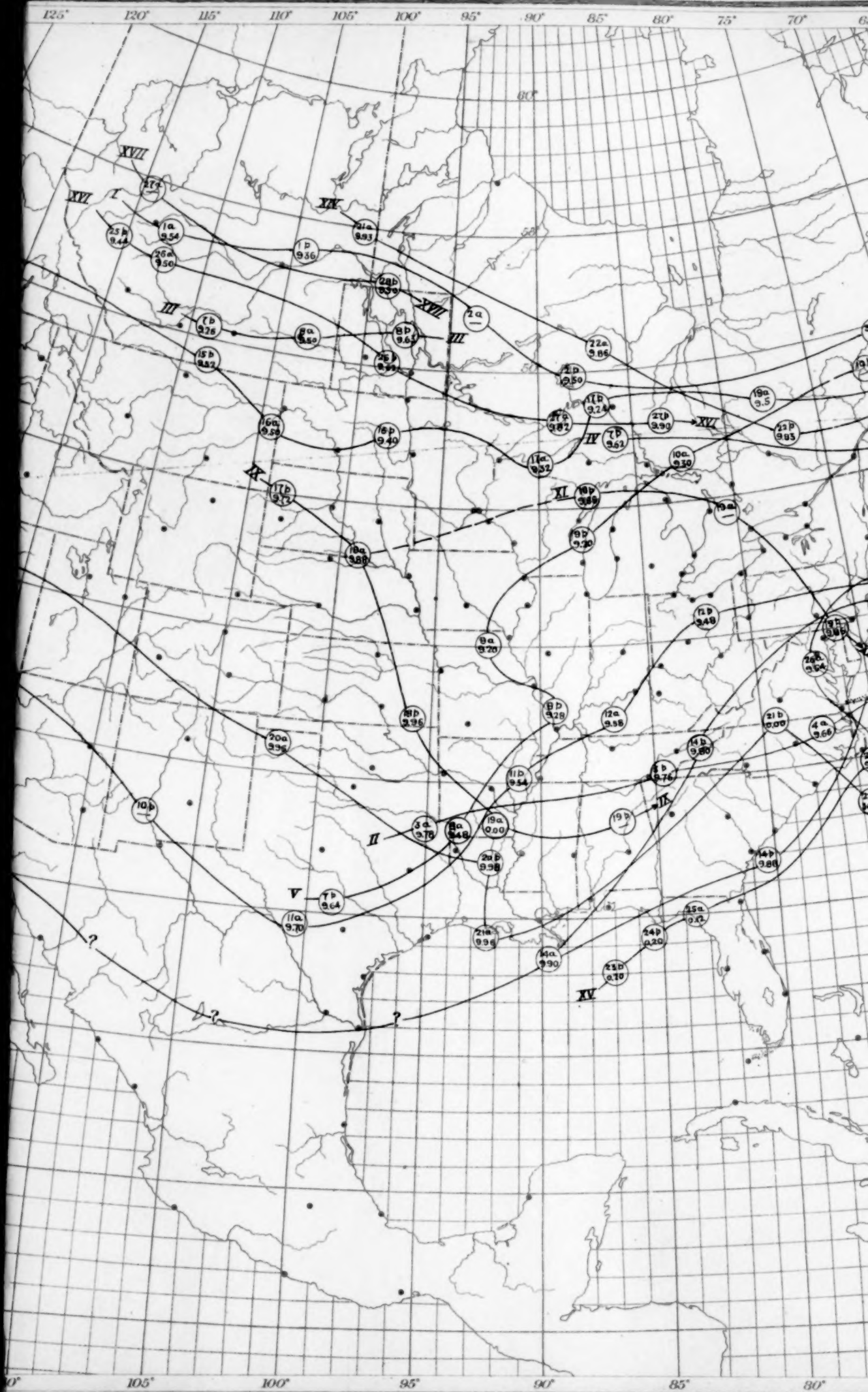
110°

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100

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Chart I. Tracks of Centers of Low Areas. February, 1894.

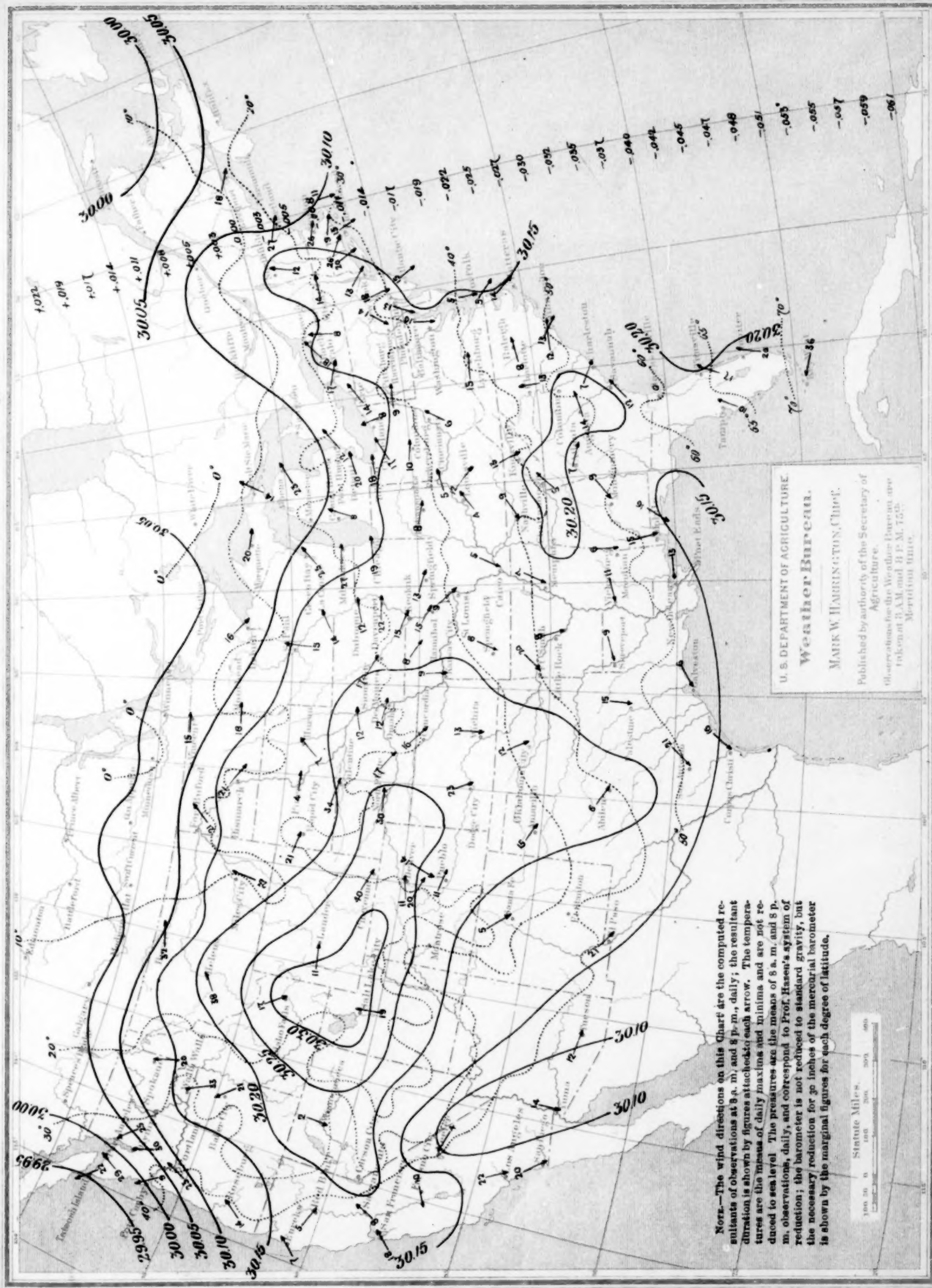




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Handwritten notes in the left margin, partially obscured by the binding.

Chart II. Isobars, Isotherms, and Resultant Winds. February, 1894.



U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
 MARK W. HARRINGTON, Chief.
 Published by authority of the Secretary of Agriculture.
 Observations for the Weather Bureau are taken at 8 A.M. and 8 P.M. 75°
 Meridian time.

NOTE.—The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant direction is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are not reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and correspond to Prof. Hagen's system of reduction; the barometer is not reduced to standard gravity, but the necessary reduction for 30 inches of the mercurial barometer is shown by the marginal figures for each degree of latitude.

Chart III. Total Precipitation. February, 1894.

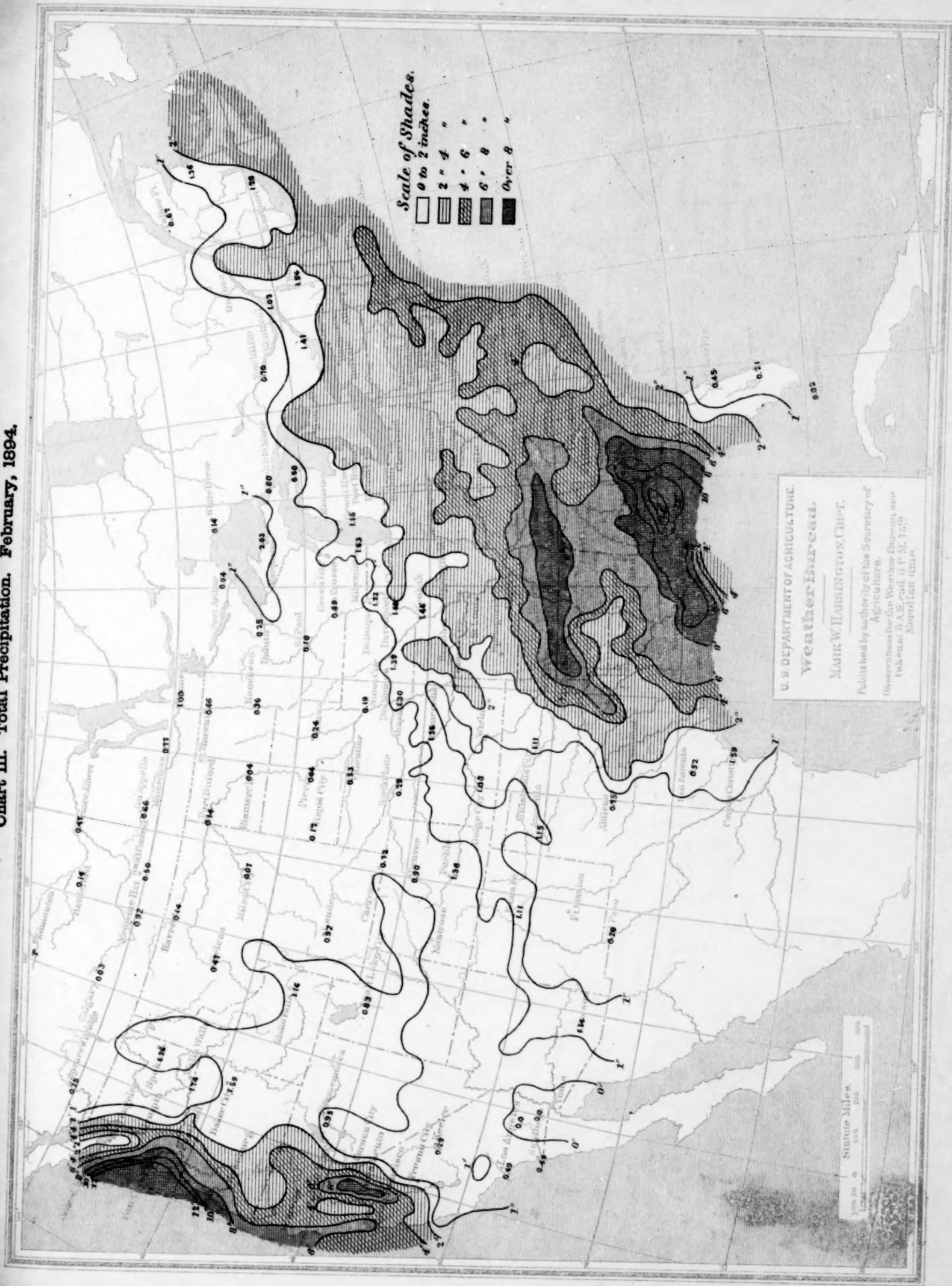
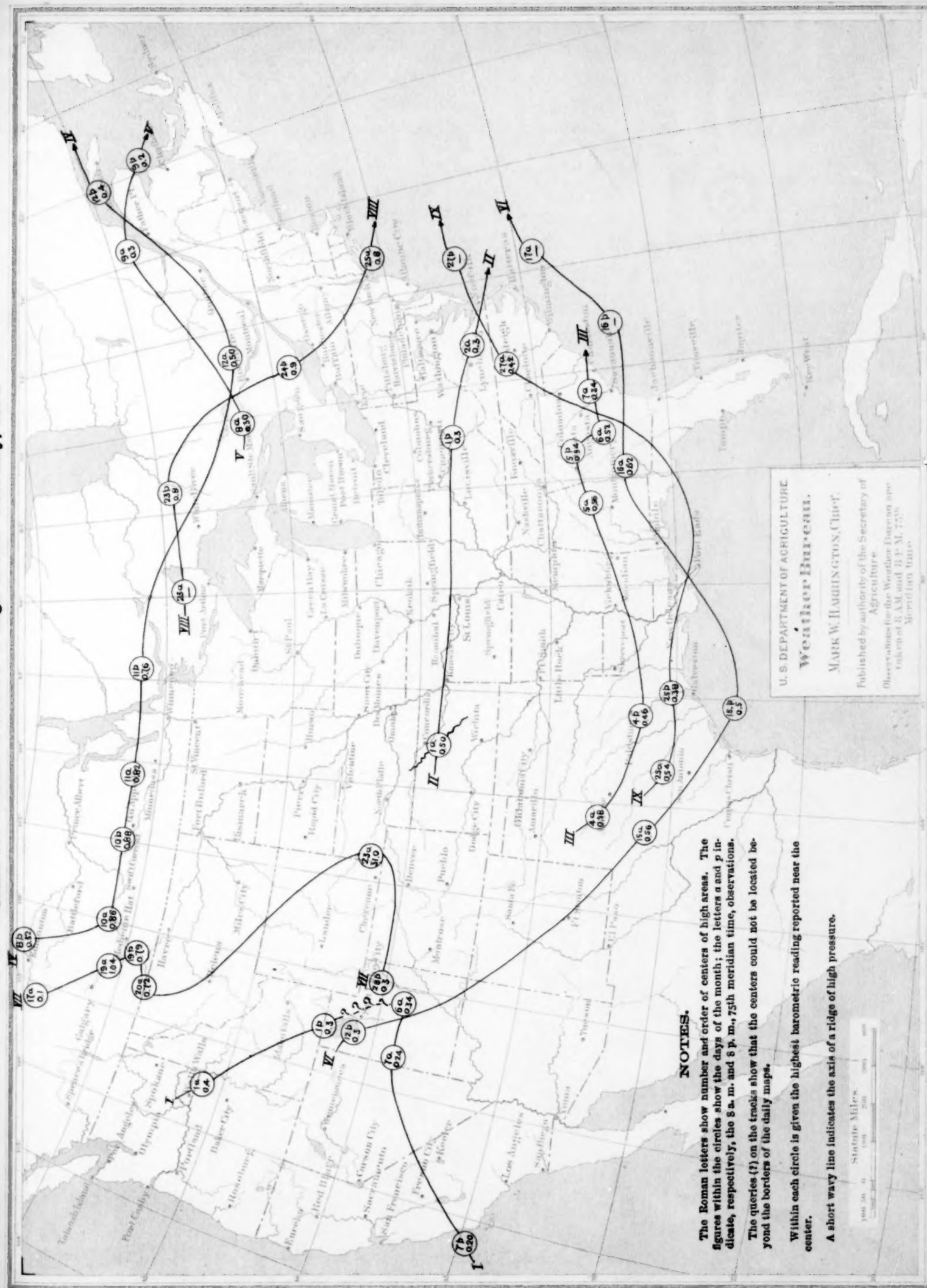


Chart IV. Tracks of Centers of High Areas. February, 1894.



U. S. DEPARTMENT OF AGRICULTURE

Verfahren

MARK W. HARRINGTON, Chief,

Published by authority of the Secretary of

Agriculture

Disinfectants for the Wooden Floor are important

Published by J. A. M. and J. P. M., 75%

Measurement times

NOTES.

The Roman letters show number and order of centers of high areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 5 a. m. and 8 p. m. 75th meridian time, observations.

The queries (?) on the tracks show that the centers could not be located beyond the borders of the daily maps.

Within each circle is given the highest barometric reading reported near the center.

A short wavy line indicates the axis of a ridge of high pressure.

1. The first part of the paper is devoted to a general discussion of the subject.

2. The second part is devoted to a detailed description of the various cases.

3. The third part is devoted to a discussion of the various methods of solution.

4. The fourth part is devoted to a discussion of the various applications of the theory.

5. The fifth part is devoted to a discussion of the various results of the theory.

6. The sixth part is devoted to a discussion of the various conclusions of the theory.

7. The seventh part is devoted to a discussion of the various remarks of the theory.

8. The eighth part is devoted to a discussion of the various notes of the theory.

9. The ninth part is devoted to a discussion of the various references of the theory.

10. The tenth part is devoted to a discussion of the various conclusions of the theory.

11. The eleventh part is devoted to a discussion of the various remarks of the theory.

12. The twelfth part is devoted to a discussion of the various notes of the theory.

13. The thirteenth part is devoted to a discussion of the various references of the theory.

14. The fourteenth part is devoted to a discussion of the various conclusions of the theory.

15. The fifteenth part is devoted to a discussion of the various remarks of the theory.

16. The sixteenth part is devoted to a discussion of the various notes of the theory.

17. The seventeenth part is devoted to a discussion of the various references of the theory.

18. The eighteenth part is devoted to a discussion of the various conclusions of the theory.

19. The nineteenth part is devoted to a discussion of the various remarks of the theory.

20. The twentieth part is devoted to a discussion of the various notes of the theory.

21. The twenty-first part is devoted to a discussion of the various references of the theory.

22. The twenty-second part is devoted to a discussion of the various conclusions of the theory.

23. The twenty-third part is devoted to a discussion of the various remarks of the theory.

24. The twenty-fourth part is devoted to a discussion of the various notes of the theory.

25. The twenty-fifth part is devoted to a discussion of the various references of the theory.

26. The twenty-sixth part is devoted to a discussion of the various conclusions of the theory.

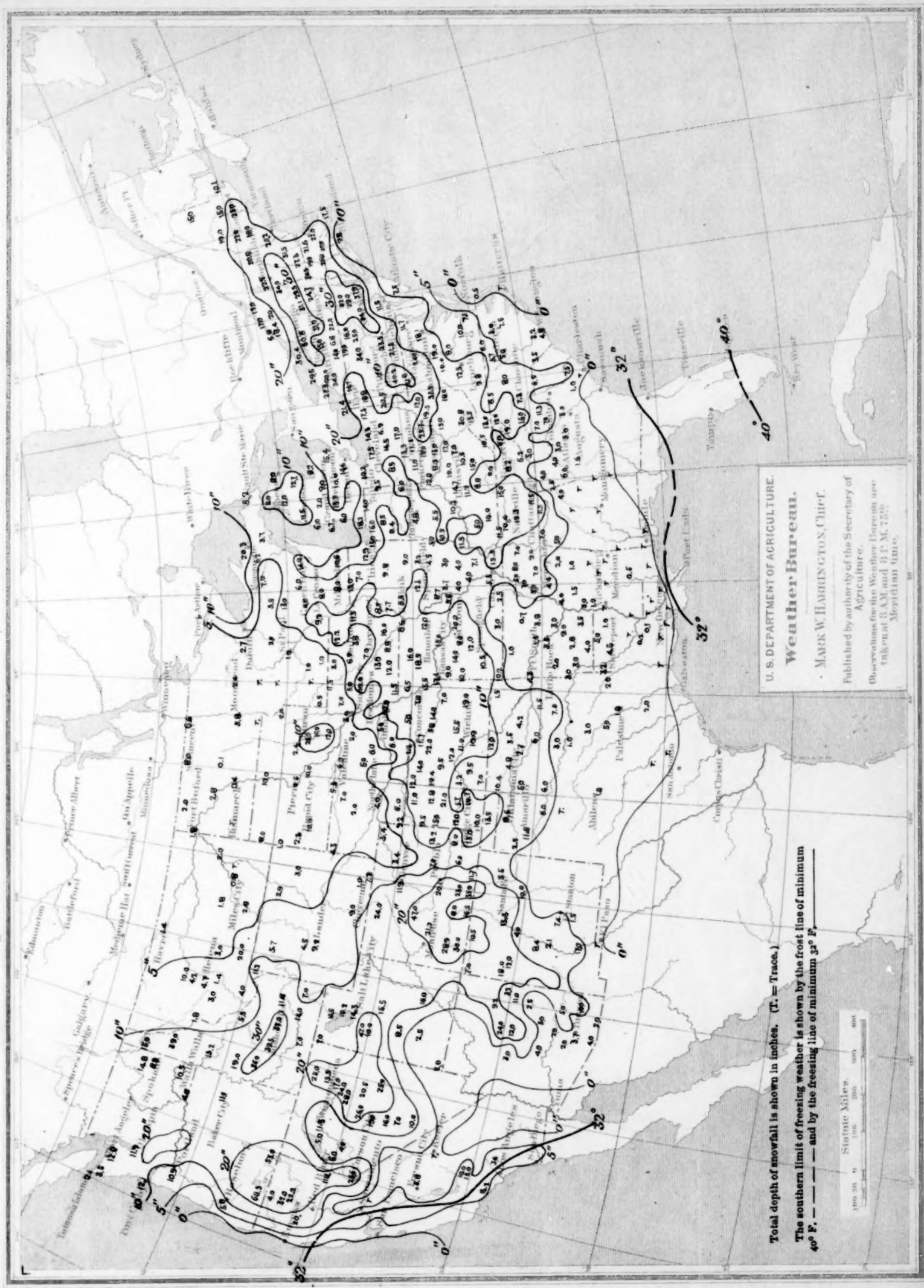
27. The twenty-seventh part is devoted to a discussion of the various remarks of the theory.

28. The twenty-eighth part is devoted to a discussion of the various notes of the theory.

29. The twenty-ninth part is devoted to a discussion of the various references of the theory.

30. The thirtieth part is devoted to a discussion of the various conclusions of the theory.

Chart V. Depth of Snowfall (inches) and Limits of Freezing Weather. February, 1894.



Total depth of snowfall is shown in inches. (T. = Trace.)
 The southern limit of freezing weather is shown by the frost line of minimum 40° F. — — — — and by the freezing line of minimum 32° F. — — — —

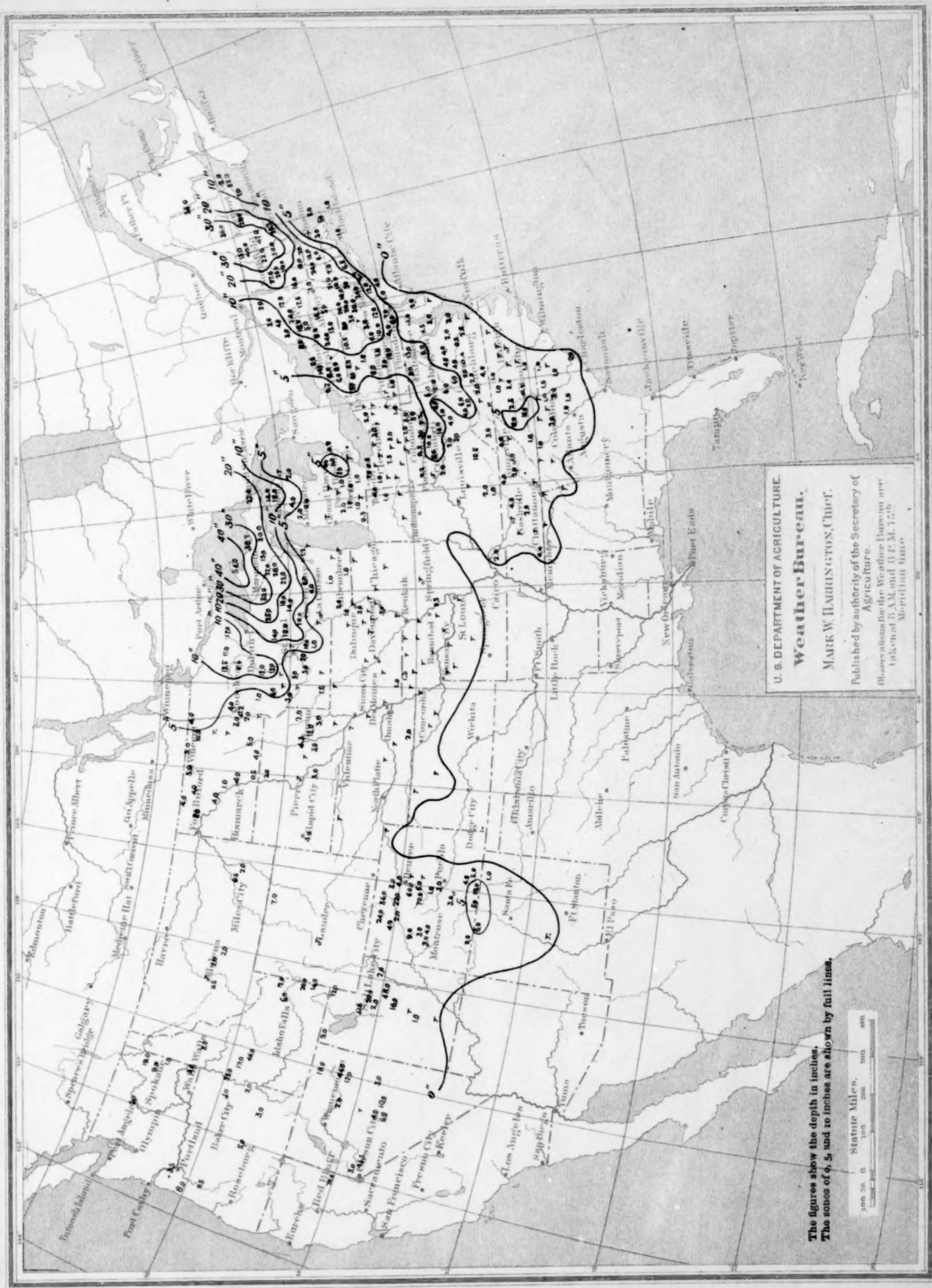
U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
 MARK W. HARRINGTON, Chief.
 Published by authority of the Secretary of Agriculture.
 Observations for the Weather Bureau are taken at 3 A.M. and 3 P.M. 75th Meridian time.



Sketch of the coast of the Gulf of Mexico, showing the location of the various islands and the course of the Gulf Stream.

Sketch of the coast of the Gulf of Mexico, showing the location of the various islands and the course of the Gulf Stream.

Chart VI. Depth of Snow lying on ground February 28, 1894.



The Annual Summary for 1893, Supplement to the Monthly Weather Review for December, 1893, will not be ready for distribution for several months.

This Summary will also contain a subject index to the Monthly Weather Review, January to December, 1893.

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